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Napp Technologies, Inc.

Lodi, New Jersey

Remedial Investigation Report/Remedial Investigation Workplan Addendum ISRA Case No. 95400

Volume I

ENSR Consulting and Engineering

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APPENDICES

1.0 EXECUTIVE SUMMARY

1.1 Executive Summary

On behalf of Napp Technologies, Inc., ENSR Consulting and Engineering has undertaken an extensive investigation of the properties formerly operated by Napp Technologies, Inc. ("Napp") in Lodi, New Jersey. These properties include the property located at 199 Main Street ("Napp Site" or "Subject Site") and the northern portion of the property owned by Robert Fortunato and/or affiliated entities located at 175 Main Street ("Sawwood Warehouse") (collectively the Sites). Following completion of emergency response actions in the summer of 1995 following the April 21, 1995 incident, ENSR undertook comprehensive remedial activities over a 21-month period. These activities included investigation of the Subject Site, removal of residual material from an historic trench system beneath the floor of the Subject Site and investigation of the environs. Analyses of this residual material indicate that it resulted in large part from historic operations at the Subject Site that predate occupancy by Napp. The investigation also included comprehensive sampling and analyses of environmental media at the properties and the adjacent Saddle River. The investigation activities include the analysis and evaluation of approximately 300 soil samples, approximately 90 samples of residual material removed from the historic subsurface trench system, approximately 10 samples of sludge-like material from subsurface vaults and tunnels underlying the Subject Site below the depth of the historic trench system, 6 sediment samples from the Saddle River, 18 surface water samples from the Saddle River and 10 groundwater samples from monitoring wells located at the Subject Site. At present, all accessible residual material in the trench system on the Subject Site has been removed and appropriately disposed. The sludge-like material from the vault/tunnel areas below the Subject Site has been similarly handled. Information obtained through these investigation activities was supplemented by the review of available NJDEP and other files of remediation actions at neighboring properties. In addition, ENSR obtained sampling data from governmental agencies and other persons collected during, and since, the April 21, 1995 incident which ultimately led to the initiation of this case. Remedial activities to date, which constitute actions through and including the Remedial Investigation stage of remediation as set forth in NJDEP's Technical Requirements for Site Remediation, N.J.A.C. 7:26E ("TRSR")[1], have identified 30 Potential Areas of Environmental Concern (PAECs) at the Subject Site. Table 1-1 summarizes the completed and proposed activities in each PAEC.

[1]The preliminary assessment and site/remedial activities discussed in this report were performed prior to the recent readoption of the TRSR. Accordingly, the requirements of the TRSR as originally adopted effective June 7, 1993 are the basis for the remediation activities performed to date. Thus, references to the TRSR in this report are to the June 7, 1993 promulgation, unless otherwise noted.

The Remedial Investigation has revealed the presence of organic contaminants, PCBs, phenol, and metals in soil at various locations. Additionally, concentrations of phenol and some organic compounds are present in groundwater above NJDEP Class II-A Groundwater Quality Standards (GWQS). A detailed discussion of the scope and the results of the investigation activities undertaken to date is contained in Sections 2 through 5 of this report.

The remedial investigations to date have been conducted in three phases. Phase I sampling was conducted to provide a general indication of the surrounding conditions, and in some cases sample locations were collected by or at the direction of the NJDEP, USEPA and/or other governmental officials. The Phase II remedial investigation was conducted in accordance with the February 1996 Remedial Investigation Workplan (RIW) which was conditionally approved by the NJDEP in its letter dated October 1, 1996. This phase of sampling consisted of samples from site soils associated with the identified PAECs, as well as waste classification sampling and an extensive trench investigation. The Phase III remedial investigation generally consisted of delineation of areas where compounds were detected during Phase II sampling above the current NJDEP soil remediation standards.[2] However, due to many unique factors impacting environmental conditions at the Subject Site, ENSR and Napp propose to delineate soil contamination to NJDEP IGSCC rather than to NJDEP RDCSCC or NRDCSCC. Therefore, discussion of specific compounds detected in samples collected during the Phase I, II and III investigations is generally limited to compounds that exceed NJDEP IGSCC.

Additional soil sampling is proposed in this Remedial Investigation Report/Remedial Investigation Workplan Addendum (RIR/RIWP Addendum) as a Phase IV remedial investigation in areas where concentrations of compounds detected in samples collected in Phase II and Phase III exceed the NJDEP IGSCC. Additional soil sampling is proposed in the Conclusions and recommendations Sections of Section 5 for PAEC E, F, G, PAEC J, and PAEC M. The soil sampling is proposed to address the following contaminants:

Various chlorinated VOCs[3] (PAECs E, F, G, J)
Phenol (PAECs E, F, G, J, M)

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[2] In the April 1993 Site Remediation News (Volume 5, November 1), the Department listed criteria for soil remediation. Numerical values were established for Residential Direct Contact Soil Cleanup Criteria ("RDCSCC"), Non-Residential Direct Contact Soil Cleanup Criteria ('NRDCSCC') and Impact to Groundwater Soil Cleanup Criteria ("IGSCC"). These criteria, as modified by additional NJDEP determinations for individual contaminants, have been utilized in this investigation.

[3]One of the chlorinated VOCs, chlorobenzene, is widespread at the Sites but was not used by Napp in quantities greater than laboratory quantities (less than 10 pounds).

PCBs (PAECs E, F, G, J, M)
One or more BTEX constituents (PAEC J)

Further groundwater investigation, through the installation of additional shallow and deeper groundwater monitoring wells, is also proposed to further characterize the subsurface geology and groundwater conditions at the Subject Site. The additional monitoring wells will be utilized to further evaluate the presence of volatile organic compounds, phenol, acid extractible compounds, PCBs, lead, arsenic, mercury and nickel. The new monitoring wells will be located near the perimeter of the Subject Site to evaluate the groundwater quality entering the Subject Site and to evaluate the groundwater below the Subject Site. In addition, a geoprobe investigation will be conducted to characterize the lithology below the Subject Site. Discussion of these additional investigation activities is contained in Section 5 Conclusions and Recommendation subsections and they are summarized in Section 6.

The proposal for further investigation takes into consideration numerous unique factors present at the properties and the surrounding area. Such factors, which are discussed in detail throughout this report, dictate that the properties not be evaluated in the conventional manner in order to select an appropriate remedial action. The unique factors include the following:

1. The Subject Site and surrounding area and their environs have historically been used for industrial purposes commencing in the late 1800's with the former United Piece Dye Works. The Subject Site represents only a portion of the former Dye Works. The historic subsurface trench system discovered on the Subject Site is associated with the Dye Works and likely exists at other neighboring facilities that were also previously part of the Dye Works.

2. Contaminants found at the Subject Site in the subsurface trenches, vaults and tunnels, soil and groundwater include materials which were not used by Napp or which were used only in laboratory quantities for testing purposes.

3. Widespread historic fill exists at the Subject Site and in the surrounding area. The level of contaminants in the historic fill varies throughout the Subject Site making complete delineation impossible.

4. Regional groundwater contamination exists throughout Lodi and in the immediate vicinity of the Subject Site. Groundwater monitoring data indicate that contaminated groundwater is migrating onto the Subject Site from a neighboring industrial facility. Thus, remediation of groundwater to NJDEP Class II-A GWQS is not technically practicable or feasible. It is also not environmentally warranted because, although

groundwater flow is generally towards the Saddle River the present groundwater condition does not have an adverse impact on this surface water body.

5. The properties at issue are included in an area scheduled for redevelopment. Lodi officials have indicated that the properties are designated for use as a paved parking area. This use will employ an impermeable cap for the properties to prevent direct contact with materials present at the Sites. An impermeable cap is an appropriate remedial measure to address the contaminated soils and groundwater at the Subject Site.

The aforementioned factors warrant flexibility and creativity in determining the appropriate investigation and remediation activities for the Sites. In this regard, Napp proposes to conduct appropriate, necessary environmental investigations and remedial actions to complete this ISRA case. Variances from the strict letter of the TRSR are sought as discussed more fully in Appendix A. With regard to soils remediation, Napp seeks confirmation from NJDEP that the capping remedy for the Sites will be protective of human health and the environment. To supplement this engineering control, Napp intends to utilize institutional controls in the form of a Declaration of Environmental Restrictions to provide notice of the residual soils conditions and to prohibit residential use of the property. For groundwater, Napp intends to seek, at the appropriate time, NJDEP designation of a Classification of Exception Area.

Napp has undertaken a comprehensive site investigation which substantially complies with the NJDEP TRSR. Remedial activities to be performed in the future will be:

- Completion of the additional remedial investigation activities proposed in this report.
- Implementation of a final remedial action which includes the capping of the Subject Site.
- Recording of a Declaration of Environmental Restrictions.
- Establishment of a Classification Exception Area.

In total, these activities will constitute an appropriate, efficient and cost-effective action to protect human health and the environment. Completion of these actions will appropriately address the environmental concerns posed by the Subject Site in light of the unique factors that presently exist in the area and the future use of the caps on the Subject Site and the Main Street area for urban redevelopment.

1.2 Introduction

This Remedial Investigation Report (RIR)/ Remedial Investigation Workplan (RIWP) Addendum has been prepared for the Napp Technologies, Inc. facility located at 199 Main Street in Lodi, New Jersey (the "Subject Site"). Napp is a manufacturer of bulk generic drugs and performance chemicals for the cosmetic and pharmaceutical industry, serving as a world-wide source of generic drugs. The Subject Site is located on the east bank of the Saddle River in Lodi, Bergen County. Figure 1-1, Site Location Map shows the general site location.

The Subject Site was operated by Napp from 1970 until 1995. On April 21, 1995 an industrial accident at the facility resulted in a fire and explosion, destroying a portion of the facility and causing the plant operations to be terminated. Napp immediately initiated emergency response procedures under the oversight of the New Jersey Department of Environmental Protection (NJDEP). Napp is currently in the process of closing the Subject Site under ISRA Case No. 95400.

The Preliminary Assessment (PA) was completed, and a PA Report submitted to NJDEP in February 1996. Initial site characterization sampling conducted by ENSR/Napp indicated the presence of contamination in certain areas above the applicable remediation standards. As a result, in accordance with N.J.A.C. 7:26E-3.3(d), the site investigation phase was discontinued and the remedial investigation phase was initiated. A Remedial Investigation Workplan (RIW) was submitted to NJDEP in February 1996. As of April 1996, Napp had not received written comment from NJDEP regarding either the PA or the RIW. Therefore, in order to proceed with site closure, the remedial investigation was initiated prior to NJDEP written approval. The proposed sampling activities were discussed with the NJDEP in a meeting on May 7, 1996 and during a site visit by the NJDEP Case Manager on May 15, 1996. Following the meeting and site visit, several adjustments were made to the proposed sampling program based on comments received from the NJDEP. In addition, based upon the initial results of the sampling program, additional remedial investigations and remedial actions have been implemented at the Subject Site.

The RIW was conditionally approved by NJDEP in its October 1, 1996 conditional approval letter. Appropriate adjustments to the sampling program were made in response to this letter. In addition, responses to this letter are provided throughout Section 5.0 and in Appendix B.

In order to close the Subject Site in an environmentally sound and timely manner consistent with the NJDEP TRSR, and to put the property back into productive use in accordance with the Borough of Lodi's redevelopment plan, Napp has conducted extensive environmental investigations at the Subject Site. These investigations have included evaluation of ap-

proximately 30 Potential Areas of Environmental Concern (PAECs) that were identified during the preparation of the Preliminary Assessment (PA) for the Subject Site. Environmental investigations have included both on-site and off-site analysis of various environmental matrices, including soils, groundwater, surface water and sediment of the Saddle River. To date, hundreds of samples have been collected and analyzed in regard to the closure of the Subject Site.

During ENSR's environmental investigations at the Subject Site, a historic trench system was discovered below the floors of many of the buildings utilized by Napp. This historic trench system appears to have been installed in the late 1800s and early 1900s in connection with operations during this period. Starting in the spring, and working through the summer of 1996, Napp conducted extensive investigations and remedial activities to address this trench system. This work included chemical analysis of residual material found in the historic trench system (which indicated elevated concentrations of contaminants such as polychlorinated biphenyls (PCBs) and chlorobenzene[4]), installation of over 600 corings through the facility floors in order to assess the extent of the historic trench system, removal of residual waste materials found in the historic trench system, and analysis of soil samples below the historic trenches to assess the impact the trenches may have had on the environment. Napp has completed the removal of large quantities of contaminated residual material from the Subject Site. These trenches are known to extend off-site in a southerly direction from the Subject Site to the warehouse area leased from R&R Reality/Robert Fortunato.

Based on ENSR's evaluation of the results of the extensive environmental sampling conducted on behalf of Napp, there appears to be contamination throughout the Subject Site. This contamination includes predominant compounds such as PCBs and chlorobenzene which are not believed to be associated with Napp's operations. Furthermore, much of the contamination does not appear to be associated with specific PAECs that were identified during the PA, and is most likely associated with historic industrial activities that were conducted in a large area encompassing the Subject Site and its environs long before Napp started operations in the early 1970's. These widespread historic industrial activities have resulted in a regional contamination problem.

Supplementary investigations conducted by Napp subsequent to the PA have provided additional information concerning the Subject Site and the immediate surrounding area. In summary, the Subject Site and surrounding area have been used for industrial purposes for over 150 years. Past industrial activities include, but are not limited to, printing operations, bleaching and dyeing

[4] An extensive evaluation of compounds used by Napp indicates no record of PCB use and only laboratory de minimis quantities (less than 10 pounds) of chlorobenzene.

operations, chemical, cosmetic, pharmaceutical and dye[5] manufacturing, and rubber works. Of particular importance is the former United Piece Dye Works facility, which was situated on both sides of the Saddle River, and encompassed a large area including the Subject Site, extending more than 2000 feet beyond the Subject Site (See Figure 1-2). Industrial fires involving dyeworks structures have been documented to have occurred in 1833, 1843, 1971, 1973 and 1974. Details concerning these fires and much of the industrial activities for over 100 years of the extensive industrial use of the property are unknown, but such uses have undoubtedly resulted in many undocumented spills or discharge incidents that have impacted the Subject Site and surrounding area.

As for the regional contamination problem that has been documented in the area surrounding the Subject Site, review of available information from various sources has revealed that there are approximately 40 known or suspected contaminated sites within 1 mile of the Subject Site. Figure 1-3 depicts the locations of these sites and provides a summary of the documented contamination problems. Contaminants found in soils and/or groundwater at these sites include, but are not limited to, volatile and semi-volatile organic compounds, metals and PCBs. Of particular note is the ISRA file for the Hexcel facility (currently Fine Organics) immediately north of the Subject Site. This facility is extensively contaminated with many compounds including chlorobenzene and PCBs (predominantly Aroclor 1242 and 1248 in contrast to Aroclor 1254 and 1260 predominantly found at the Subject Site). Based on a review of NJDEP's files, PCBs appear to be associated with the Hexcel operation of this property, but chlorobenzene was not used by Hexcel[6].

There are also nine public water supply wells (previously used by the Borough of Lodi for drinking water) located in all directions around the Subject Site that have been closed because of contamination primarily from chlorinated volatile organics. The USEPA[7] attributes the groundwater contamination to a regional problem with an unknown source or multiple sources. This regional groundwater contamination problem has reportedly impacted a 4-square mile area.

The adjacent Hexcel facility also has a documented groundwater contamination problem (including DNAPL and LNAPL) which Hexcel has attributed to historic operations or the regional

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[5] The use of chlorobenzene has been documented in the manufacturing of aniline dyes.

[6]The presence of chlorobenzene at the property north of the Subject Site further indicates that this contaminant is associated with past operations associated with a larger area than the Subject Site.

[7] Westlaw, Federal Environmental Superfund Records, Records of Decision - ROD, Lodi Municipal Wells, Lodi, NJ.

contamination problem. Based on the above information concerning groundwater contamination and information obtained during the remedial investigations discussed herein, ENSR believes the Subject Site also has been significantly impacted by industrial activities on off-site properties and/or that pre-date Napp's occupancy of the Subject Site.

As a result of the groundwater contamination problems discussed above, the immediate area surrounding the Subject Site is no longer used for potable water. According to an October 15, 1990 letter from Hexcel to NJDEP, there are no potable supply wells within a half mile radius of the adjacent Hexcel site. In accordance with N.J.A.C. 7:26E-4.4(h)1, ENSR also conducted a well search of the area surrounding the Subject Site. This well search confirms Hexcel's findings that there are no potable supply wells within a one-half mile radius of the Subject Site. According to a letter from Killam Associates, on behalf of Hexcel, the NJDEP concurred with this determination in a letter dated June 13, 1991, specifically stating that the "facility is not in a water use area."

In addition to the regional contamination problem which affects the Subject Site, widespread "historic fill" has been found on the Subject Site and the surrounding area. Various contaminants attributed to historic fill such as heavy metals and polynuclear aromatic hydrocarbons (PAHs) have been documented above NJDEP RDCSCC and NRDCSCC at locations surrounding the Subject Site.

ENSR's investigations of the Subject Site documents the presence of significant amounts of historic fill. The majority of borings at the Subject Site exhibit the characteristics of dredged river sediments and/or debris-type fill. Based on review of NJDEP files, this finding is consistent with the findings on neighboring properties. Metals and PAH compounds comparable to those found in historic fill at other sites in the area have been detected at many locations on the Subject Site. The results of the NJDEP file review are discussed further in Section 5.3.

The presence of historic fill makes delineation sampling extremely difficult and often prevents complete delineation. This is because the level of contamination in historic fill material varies significantly from area to area, and contaminants often do not follow a predictable pattern or concentration gradient. In addition, hot spots which are often present are typically randomly distributed. The regional contamination in the area of the Subject Site further complicates the task of delineating contamination at the Subject Site in accord with NJDEP requirements.

Napp believes the ultimate remediation performed should reflect Lodi's redevelopment plan that calls for paving the entire Subject Site and surrounding area. Such capping of the Subject Site is consistent with the installation of an engineering control which is a common remedial action used to address the widespread historic fill problem in New Jersey. The impermeable cover will

serve as a barrier between contaminated soil and direct human contact. An impermeable cap will also prevent percolation of precipitation into contaminated soils, thereby minimizing the potential leaching and migration of soil contaminants into the groundwater and/or surface water.

As a result of the considerations presented herein, the capping of the Subject Site coupled with potential source area removal, the development of a Declaration of Environmental Restrictions (DER) and establishment of a Classification Exception Area (CEA) is considered by Napp to be an appropriate future remedy for the Subject Site ("Presumptive Remedy"). Napp's Presumptive Remedy also removes potential concerns related to direct contact of contaminated material and makes further delineation to NJDEP's RDCSCC or NRDCSCC unnecessary.

Based on the many factors discussed above, the Subject Site should not be evaluated through the conventional process of sequenced site investigation, remedial investigation and feasibility study to select an appropriate remedial action. Instead, Napp wishes to conduct necessary environmental investigations and remedial actions (such as removal of residual source areas of contamination, if deemed necessary) and to confirm, considering site specific circumstances, that the Presumptive Remedy for the Subject Site will be protective of human health and the environment.

This document further details the activities conducted to-date, and has been prepared in accordance with appropriate sections of the NJDEP TRSR.

1.3 Variances From Technical Requirements for Site Remediation

The numerous unique characteristics presented by the Subject Site and the surrounding environs, and the historical use of the Subject Site and neighboring properties make strict compliance with the NJDEP TRSR unnecessary, impracticable and inappropriate in certain respects. The past and future performance of remedial actions that are in substantial compliance with NJDEP's TRSR are adequate to identify, and preclude in the future, unacceptable impacts to human health and the environment. Accordingly, as previously discussed with NJDEP representatives during a December 10, 1996 meeting in Trenton, ENSR, on behalf of Napp, is requesting both a general variance and variances from specific portions of NJDEP's TRSR. These variances are necessary considering the many environmental factors at the Subject Site, that are beyond the control of Napp (i.e., historic fill, regional contamination, contamination migrating onto the Subject Site, etc.). As more fully discussed in Appendix A, ENSR and Napp presently seek variances from the TRSR to modify the remediation in ISRA Case #95400 to: (1) allow the use of IGSCC, rather than RDCSCC and/or NRDCSCC for vertical and horizontal delineation of the Subject Site; (2) allow the use of physical boundaries such as the water table and/or physical barriers for vertical delineation; (3) allow reduced post-remediation soil sampling;

(4) waive the future use of methanol preservation of VOC samples; (5) limit off-site delineation of soil contamination; (6) and, not require future soil delineation sampling to be biased towards "worst case" conditions. Completion of the proposed activities herein will result in the implementation of remedial activities that will be in substantial compliance with the NJDEP TRSR and the intent of ISRA. The variance requests are provided as Appendix B to this report. Additional requests may be submitted as new situations are encountered.

2.0 HISTORICAL SUMMARY

This chapter presents relevant historical information in accordance with N.J.A.C. 7:26E-4.9(b)1.

2.1 Site History

The Subject Site, Block 81.01, Lots 7 and 8, was acquired in the early 1970s. The previous owner, B.L. Lemke & Company, Inc. (Lemke) was a chemical manufacturer for the pharmaceutical industry, and produced and stored pharmaceutical, cosmetic, and food chemical products from 1946 to 1970. Lemke operations included storage of muriatic acid, iso-propyl alcohol, ethyl acetate, methyl alcohol, and N-propyl alcohol in the aboveground tanks later used by Napp. Please refer to the Preliminary Assessment (PA) Report for additional information related to material storage.

Prior to purchase of the Subject Site by Lemke, the Subject Site was owned by various industries including the United Piece Dye Works (UPDW). The Subject Site was a small portion of a large facility operated by UPDW, which was situated on both sides of the Saddle River, and encompassed a large area on the east side of the Saddle River (See Figure 1-2). Activities commencing in the 1800's conducted by UPDW and its successors included dyeing, printing, and finishing of textile fabrics, as well as manufacturing of dyes and pharmaceutical compounds. No specific information has been found concerning processes conducted and chemicals used on the portion of the former dye works occupied by Napp. The dye works operated until the 1920s-1940s. Information indicates that, during the period up through the 1920s-1940s, a chemical works was present on the Subject Site. When these operations terminated in the 1930s and 1940s, portions of the property were taken over by the Borough of Lodi and then leased or sold to a variety of commercial and industrial tenants.

Napp manufactured bulk generic drugs and performance chemicals for the cosmetic and pharmaceutical industry at the Subject Site. Processes conducted at Napp included the synthesis and drying of compounds mixed with water and/or solvent, the blending and grinding of mixtures of dry powder, sometimes mixed with water to produce other products, and micronizing and other particle size reduction operations. Specific processes included, but were not limited to, para-hydroxybenzoic acid production, trimethoprim production and methylparaben production. Primary products were methylparaben (methyl para-hydroxybenzoate) and propylparaben (propyl para-hydroxybenzoate), which are used as preservatives in the food, beverage, pharmaceutical, and cosmetics industries.

Napp operated the manufacturing facility at the Subject Site from 1970 until operations ceased following the explosion on April 21, 1995. In general, the Napp operations, buildings and structures did not change significantly since 1971-73. However, between 1981 and 1990, most components (e.g., floor drains, pump stations, and catch basins) of the wastewater collection system were either replaced or relined, as discussed in Section 5.10. Facility parking was within a paved, fenced-in parking lot on the northwest portion of the property to the rear of the building. Southwest of the parking area was a paved area used for the storage of hazardous (toxic, corrosive, and flammable) liquids. This area was separated from the adjacent parking lot by a number of aboveground product storage tanks containing materials that Napp used as raw materials in its processes (e.g., muriatic acid, methanol, potassium hydroxide, propanol or isopropanol, and caustic). A 6,000-gallon phenol tank and a 32-ton carbon dioxide (CO_2) tank were installed by Napp in the rear yard in approximately 1985 in order to accommodate Napp's production activities.

To accommodate a need for additional warehousing space, in 1981 Napp began occupying warehouse space (approximately 18,000 square feet) located in the former Eisen Metals building at 175 Main Street (Block 81.01, Lot 6) immediately south of the Subject Site for use solely for the warehousing of non-flammable raw materials and finished goods for cosmetics, pharmaceuticals, anti-bacterials, and similar uses. An additional 5,000 square feet was occupied beginning in 1985. This area is referenced elsewhere as the Sawwood Warehouse.

2.2 Aerial Photograph Review

ENSR performed a review of available aerial photographs for the years 1940, 1951, 1953, 1961, 1966, 1971, 1974, 1991 and 1993. ENSR submitted stereo pair aerial photographs for 1966 and 1993, and a single aerial photograph for 1973 to NJDEP with the PA Report. ENSR also reviewed Lodi Building Department, Fire Department, Tax Assessor and deed records, a 1933 and 1946 Lodi Directory, and Sanborn Fire Insurance Maps dated 1917, 1951 and 1968. Copies of the Sanborn Maps were also submitted with the PA Report. A summary of conclusions developed based on ENSR's review of available aerials and historical information is presented below.

Aerial photographs were not available prior to 1940; however, the 1917 Sanborn map shows the subject property as undeveloped land. From 1940 through 1968, the southern half of the Subject Site was occupied by a portion of a chemical works building that was connected to an off-site building extending to the south. During this time, facility parking was located on the north side of the chemical works building. The 1966 aerial photograph shows an unpaved area adjacent to the south side of the current facility parking lot, which was later paved and fenced-in for materials storage use. The 1968 Sanborn map shows three separate structures that occupied

the Subject Site which appear to have been remodeled by the previous owner in stages between 1966 and 1971. In 1968, one office-type structure occupied the northeast corner of the subject property at the intersection of Main Street and Molnar Lane; a second structure was located at the northwest portion of the property; and the third structure was identified on the Sanborn map as a chemical works building that extended off-site in a southerly direction along Main Street to the railroad right-of-way to the south. The 1971 aerial photograph shows the Subject Site as it existed approximately 1 year after Napp operations began. Thereafter, the property remained essentially the same until the April 1995 explosion.

The Napp building was connected by a common wall to a larger building structure which historically extended approximately 800 feet in a southerly direction along Main Street to a former railroad right-of-way near Graham Lane. The larger building is owned by Robert Fortunato or affiliates. Over the years, as seen on the 1974 and 1991 aerials, portions of this adjacent building structure on the southern end of Main Street were demolished and converted to other uses to suit Main Street businesses.

The area between the Subject Site buildings and the east bank of the Saddle River was undeveloped prior to 1961, with the exception of an unpaved roadway running in a southerly direction along the rear of the Subject Site buildings from Molnar Lane toward Graham Lane. Based on observations of aerials taken between 1940 and 1961, the undeveloped area situated between the Saddle River and the roadway behind the Subject Site buildings was historically subject to flooding.

3.0 PHYSICAL SETTING

This chapter presents relevant physical setting information in accordance with N.J.A.C. 7:26E-4.9(b)2.

3.1 Physical Conditions

The Subject Site is bounded to the north by an industrial facility operated by Fine Organics Corporation (previously operated by Hexcel Corporation), a manufacturer of interior and exterior cleaning compounds; to the east by Main Street, beyond which are small commercial businesses and residences; to the south by retail property owned by Robert L. Fortunato; and to the west by the Saddle River, beyond which is an area of light industrial development. Hexcel, whose former property is located hydrogeologically upgradient/sidegradient of Napp, is currently addressing soil and groundwater contamination (including the recovery of DNAPL and LNAPL) as part of an ongoing ISRA program.

3.1.1 Soils

Organic silt and silty fine sands were observed in surface soils collected by ENSR from soil borings adjacent to the subject property line. Reddish silty clays and sands containing some brick and stone fill material were noted at other shallow soil boring locations on-site. Various layers of fill material were observed in borings conducted at the Subject Site. A silt layer is present at depths ranging from 10 to 16 feet bgs. In one monitoring well boring, the layer appeared to be a clay rather than a silt. Occurrence of this silt/clay layer corresponds with the lithology observed at the adjacent Hexcel ISRA site where the layer is characterized as a clay layer.

Soils at the Subject Site are mapped in the Interim Bergen County Soil Survey as Urban Land, which consists of nearly level or gently sloping areas of cut and fill that is 85 percent covered by impervious surfaces (e.g., buildings, asphalt, pavement, or other structures). Urban land also includes high density residential areas that are less than 85 percent covered by impervious structures but contain reworked soils or Udorthents along stream terraces and flood plains.

Area soils can be generally characterized by the Boonton-Urban Land Association as deep, well-drained and moderately well-drained loamy soils and urban land on uplands. The soils are formed from glacial till. Along the Saddle River, soils of the Dunellen-Urban Land association can be found in nearly level to steep, well drained, loamy and gravelly sandy-loam soils and

urban land outwash plains and terraces that overlie stratified sand and gravel deposits.

3.1.2 Regional Geology and Hydrogeology

The Subject Site is located within the geologic province known as the Newark Basin. This basin is an elongated northeast-southwest trending fault trough which is filled with late Triassic and early Jurassic age fluvial and lacustrine sediments. These deposits now comprise the rocks known as the Newark Supergroup. The principal Triassic units within the basin are the Stockton Formation, the Lockatong Formation, and the Brunswick (aka the Passaic) Formation. After deposition, the rocks of the Newark Supergroup were tilted to the northwest and highly fractured. On average, beds of the Passaic Formation dip 5° to 25° to the northeast. In the northern portion of the Newark Basin, the Passaic Formation has been divided into four mappable lithologic units. The Subject Site is underlain by bedrock identified as Unit 2 of the Passaic Formation. Unit 2 consists of thick beds of sandstone with interbedded fissile mudstones.

Overlying the competent bedrock is a highly weathered bedrock zone followed by an unconsolidated glacial sediments deposited during the Wisconsinan glaciation of the Pleistocene Epoch. The unconsolidated glacial sediments are either stratified or unstratified, and are composed of a mixture of clay, silt, sand, and gravel. The thickness of glacial deposits can vary greatly depending on the topography of the underlying bedrock. In Newark (to the south of the Subject Site), thicknesses range from 80 to 250 feet (Herper & Barksdale, 1951). Along stream valleys, recent alluvial deposits are incised into the glacial deposits.

The two main aquifers which exist within the region are found in the unconsolidated deposits (principally stratified glacial deposits) and fractured bedrock. Typically, wells screened in the unconsolidated aquifer zones tend to yield less water than those screened in the bedrock aquifer. The overburden strata absorb and store water from precipitation and then transmit it to the bedrock aquifer. The weathered rock zone overlying competent bedrock tends to be of lower permeability and may slow the exchange of water between the two aquifers.

Groundwater flow within the bedrock aquifer generally occurs along nearly horizontal bedding plane partings and sub-vertical fractures oriented parallel to strike at N 30° E (Nichols, 1968), i.e. northeast to southwest. Bedding plane partings in the Passaic Formation commonly occur within zones of fissile mudstones between thick beds of sandstone.

3.1.3 Local Geology and Hydrogeology

The western border of the Subject Site is located along the Saddle River. The ground surface has a gentle slope to the west and the Subject Site is underlain primarily by river deposits

associated with the Saddle River. Underlying these deposits, unconsolidated glacial material may be present to the bedrock (Unit 2 of the Passaic Formation). Based upon Subject Site monitoring wells, ENSR has determined that groundwater occurs approximately 6 feet bgs. Groundwater flow direction is to the west-southwest towards the Saddle River below the western portion of the Subject Site. An area of radial flow exists in the vicinity of monitoring well MW-E2 in the central part of the Subject Site.

3.1.4 Topography

Figure 1-1 Site Location Map includes portions of the United States Geological Survey (USGS) Weehawkin Quadrangle and Hackensack Quadrangle maps. Figure 1-1 depicts the Subject Site and area topography. In general, the ground surface elevation varies between 20 to 25 ft above mean sea level and slopes toward the Saddle River, which forms the western site boundary. In the area of the Subject Site, the Saddle River banks are steeply sloped. Natural surface drainage patterns for the Subject Site and surrounding areas indicate that the general surface water flow direction is to the west-southwest.

3.1.5 On-site Historic Fill

Based upon a review of aerial photographs, it is apparent that the area between the Subject Site and the Saddle River bank has been built up over the years. The aerial photographs from 1940, 1951, and 1961 show inundated, low lying areas along the Saddle River shoreline immediately west and southwest of the Napp buildings. Between 1940 and 1951 the area appears to have received a moderate amount of fill. Substantially more fill was added between 1951 and 1966, apparently for channelization of the river. The position of the shoreline appears essentially unchanged since 1966. A similar sand and gravel mixture is present beneath the building floors, most likely laid as a subbase for the structures.

The source of the fill material is unknown at this time. Borings conducted in the western portion of the Subject Site, along the river bank, indicate the presence of sand, gravel, brick, and wood. These findings suggest that the material is most likely a combination of dredged sediments from the river and miscellaneous debris. This material meets the definition of "historic fill", pursuant to N.J.A.C. 7:26E-1.8 (readopted May 19, 1997). The characteristics of the fill material found at the Subject Site are further detailed in Section 5.0.

3.2 Surface Water Bodies

The majority of the Subject Site is developed; no surface waters have been identified on-site. However, the Subject Site is located adjacent to the Saddle River and lies within the 100-year

floodplain of the river, which historically has been subject to flooding. Lodi Brook, which is located approximately 800 feet in the downgradient direction south of the Subject Site, is a tributary to the Saddle River. The Saddle River flows into the Passaic River approximately 1.5 miles to the southwest of the Subject Site. The Saddle River is within the Passaic River Basin which is part of the Hudson Drainage Basin. No other major surface water bodies were identified within the vicinity of the Subject Site.

According to a December 1992 Draft Visual Site Inspection Report prepared for the Subject Site for the EPA, the Saddle River is classified for primary and secondary contact recreational use. There is no water intake for potable supply or irrigation use within 3 miles downstream of the Subject Site.

3.3 Site Location

Napp's former operations were located at 199 Main Street and situated on the west side of Main Street in Lodi, New Jersey. According to tax assessor records, the Subject Site, exclusive of leased space, occupies a 1.728-acre parcel (Block 81.01, formerly Block 81A, Lots 7 and 8) in the Borough of Lodi, in Bergen County. A warehouse area, approximately 18,000 square feet, leased at 175 Main Street, is located on a portion of Block 81.01, Lot 6. Measurements taken from a current site survey indicate that Napp occupies a total of approximately 2.1 acres.

3.4 Wetlands

The New Jersey Freshwater Wetlands Maps (Hackensack Southwest quarter-quadrangle) and the corresponding National Wetlands Inventory (NWI) Map were reviewed and a summary was included in the RIW submitted in February 1996. No freshwater wetlands are mapped within a 1,000-ft radius of the Subject Site.

3.5 Boring Logs From On-site Construction

As previously discussed, much of the Napp facility was constructed starting in the early 1800s. No boring logs related to site construction are known to exist.

3.6 Surrounding Land Use/Percent Impermeable Cover

The Subject Site is located in a Planned Commercial Development District (C-PD) in an area currently zoned for light impact industrial development. The Subject Site is located in an industrial area between Main Street and the Saddle River which extends from Route 46 to the north to Graham Lane to the south. The majority (greater than 80 percent) of the land west of

Main Street is paved, with the exception of a narrow vegetated strip of land along the east and west banks of the Saddle River and former industrial property located southwest of the Subject Site. Across Main Street from the Subject Site is an area of neighborhood retail development that is interspersed with adjacent residential development. The majority of the area east of Main Street is residential and therefore appears to be less than 50 percent covered by impermeable surfaces. Based on a review of recent aerial photography, the nearest school (Washington School), appears to be located on Main Street approximately 1,100 feet north of the Subject Site. Two ball parks (basketball, baseball and/or soccer fields) are located approximately 1,100 feet northeast and 700 feet southeast of the Subject Site.

The Subject Site is paved and/or covered with structures with the exception of a 20- by 30- feet area adjacent to the truck loading ramp and a 10- to 30-ft wide strip of vegetated land adjacent to the Saddle River, along the western site boundary, outside of the facility fenceline. The Sawwood Site is similarly paved and or covered with structures with the exception of a strip adjacent to the Saddle River.

3.7 Well Search

ENSR has conducted a well search for the area surrounding the Subject Site in accordance with the NJDEP TRSR (N.J.A.C. 7:26E-4.4(h)1). A one-half mile radius was used for domestic and monitoring/recovery wells and a one mile radius was used for public supply and industrial wells. Copies of well records for all permitted wells within one mile of the Subject Site were obtained from the NJDEP. A computer generated five mile radius map and listing was also obtained from the NJDEP for high capacity wells (i.e. wells with water allocation permits). ENSR personnel contacted the Borough of Lodi, Saddle Brook Township, Borough of Maywood, and City of Garfield to obtain information regarding the status of the domestic and monitoring/recovery wells located within one-half mile and the public supply and industrial wells within one mile of the Subject Site. The Health Department/Board of Health, Public Works Department and Water Department of each municipality was contacted. In addition, ENSR personnel contacted United Water New Jersey, Inc. (AKA Hackensack Water Company) to obtain information regarding water usage at the located addresses.

Based on information obtained to date groundwater in the immediate area of the Subject Site is not used for potable purposes. Therefore, groundwater is not expected to be a primary pathway for the compounds detected on-site to impact human health. A total of approximately 169 monitoring and recovery wells are located within approximately one-half mile of the Subject Site. Figure 3-1 depicts the approximate locations of the wells located within approximately one-half mile (domestic wells and monitoring/recovery wells) and one mile (industrial wells and public supply wells) of the Subject Site. Tables 3-1, 3-2, 3-3 and 3-4 summarize information concerning

the wells (i.e. well owner at time of installation, date of installation, type of well, depth of well, active or inactive, etc.). The well numbers indicated on Figure 3-1 correspond to the first column of Tables 3-1, 3-2, 3-3, and 3-4. Tables 3-1 through 3-4 also summarize the method of confirmation for the status of the wells listed on each table. The monitoring and recovery wells are primarily located at sites which are also mapped and discussed in Section 5.3 (Historic Fill and Regional Contamination Investigation Results) of this report. A total of three domestic wells are located within one-half mile of the Subject Site based on the well records; however, these domestic wells are not in use. Discussions with local officials confirm there is no active potable water use from any well located within 0.5-mile of the Subject Site. As indicated in Tables 3-3 and 3-4, a total of 26 industrial and 25 public supply wells are located within approximately one mile of the site boundaries. Based on information provided by the current occupants of the address listed on each well permit, local officials and the water supplier for the area, none of the industrial or public supply wells is currently being used as a potable water supply. ENSR has confirmed that three of the industrial wells are currently in use for industrial purposes.

ENSR's recent well search generally confirms well search information obtained in 1990 as part of Hexcel's ISRA case. According to an October 15, 1990 letter from Hexcel to NJDEP, there was no potable water supply well within a half mile radius of the Hexcel site, as confirmed by the Borough of Lodi Health Department and the Bergen County Health Department. Additionally, an October 15, 1992 letter from Killam, Hexcel's consultant, to NJDEP indicated that canvassing of residents and completion of a water purveyor survey confirmed that the area is not a potable groundwater use area. According to the Killam letter, the NJDEP concurred with this determination in a letter dated June 13, 1991, specifically stating "the facility is not in a water use area."

Information obtained through file reviews indicates that the Lodi Municipal Wellfield has been closed due to the presence of chlorinated volatile organic compounds. The USEPA has approved a plan of no further action for the Lodi wells and attributes the contamination to a regional problem with an unknown source or multiple sources.[8] In addition, the USEPA recommends that the groundwater not be used as a potable water supply without appropriate treatment.

[8] The Lodi Municipal Well Site is the municipal public supply wells that provided water for the Borough of Lodi from the early 1900s to the 1980s. A series of eleven bedrock (Passaic Formation) wells were installed between 1923 and 1965 to depths ranging from 300 to 600 feet bgs. In 1981 a state investigation detected VOCs above the state maximum contaminant levels (MCLs) in two of the wells. In 1983, as part of the investigation of another site, the state sampled four of the wells, VOCs were again found above the MCLs. One well was closed due the level of radioactivity detected in the well. The radioactivity was determined to be naturally occurring. In 1986 all of the wells were closed when the state drinking water standards for VOCs were lowered. The VOC contamination was determined to be regional in nature. No further action, beyond non-use of the wells, is the accepted remedial action for the Lodi Municipal Wells Site.

4.0 TECHNICAL OVERVIEW

This chapter presents a technical overview in accordance with relevant sections of N.J.A.C. 7:26E-4.9(b)3.

4.1 Sampling Methodology

4.1.1 Soil Sampling

Surface and subsurface soil samples were collected from borings during the remedial investigation. Sample depths varied throughout the Subject Site based upon the nature of the potential area of concern and the suspected contaminants. Specific sample depths and analytical parameters are presented on Table 4-1, Summary of Sampling Activities, and discussed in Section 5.0. Samples locations are identified in Figure 4-1[9] and 4-2. NJDEP soil cleanup criteria are presented on Table 4-3.

For discussion and data evaluation purposes, data are presented in the text, tables and figures in comparison to the NJDEP RDCSCC, NRDCSCC and IGSCC[10].

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[9] Based on additional information obtained since the submittal of the February 1996 Preliminary Assessment and Remedial Investigation Workplan, the drawings herein were revised to more accurately reflect the area that Napp leased from Robert Fortunato and the common area used by tenants of Robert Fortunato.

[10] ENSR and Napp are using the current NJDEP soil cleanup criteria for comparison purposes only. It should be noted that neither ENSR nor Napp necessarily agrees that these screening values form an appropriate basis for an evaluation of risk at the site. As required by part of the comprehensive legislation passed in 1993 ("S-1070"), NJSA 58:10B-12(a), Remediation Standards must take into consideration the location of the property being remediated, the surroundings, the intended use of the property being remediated, potential receptor exposure to the discharge, and surrounding ambient conditions, whether naturally occurring or man-made. NJDEP's soil cleanup criteria do not take these site specific factors into consideration. The 1993 legislation established the Environmental Risk Assessment and Risk Management Study Commission and required it "to examine and assess the scientific basis for selecting the risk management standard of one in a million...and to examine and assess the methodologies of risk assessment and their efficacy and applicability for the purpose of establishing remediation standards." Based on a Draft Report of the Environmental Risk Assessment and Risk Management Study Commission, the use of the 10^{-6} guideline as a remediation standard should not be globally applied in all risk management situations. The Commission recommended adoption of a three-tiered approach to site remediation and restatement of the current NJDEP

Soil samples were collected using either a truck-mounted drill rig, portable drill rig, hand-operated bucket auger, or hand trowel during the remedial investigation. Soil samples that were collected using a drill rig were obtained using a decontaminated 3-inch outer diameter split spoon sampler which was driven in 2-foot increments into the subsurface. Advanced Drilling, Inc., a New Jersey licensed driller, was contracted to perform the truck-mounted and portable drill rig borings. Shallow soil samples were collected using stainless steel decontaminated hand augers. Surface soil samples were collected using stainless steel hand trowels. All samples were collected in accordance with the May 1992 NJDEP Field Sampling Procedures Manual (FSPM). Boring logs for the soil borings are provided in Appendix C.

4.1.2 Sediment Sampling Methodology

Six sediment samples were collected from the Saddle River. Samples and analytical parameters are included on Table 4-1 and discussed in Section 5.0. Sample locations are identified in Figure 4-2 Sediment and Surface Water Sample Locations. Sediment samples were collected using stainless steel hand augers. Downstream samples were collected first in order to avoid disturbance of the sediments. All samples were collected in accordance with the May 1992 NJDEP FSPM.

4.1.3 Surface Water Sampling Methodology

Eighteen surface water samples were collected from the Saddle River. Samples and analytical parameters are included on Table 4-1 and discussed in Section 5.0. Sample locations are identified in Figure 4-2. All surface water samples were collected by companies other than ENSR, including Clean Venture, Kroll Environmental Enterprises, Inc., and EPA's contractor, Roy. F. Weston. Information regarding sampling methodology, although requested, has not been provided to ENSR.

4.1.4 Groundwater Sampling Methodology

Groundwater samples were collected in May 1995 from four monitoring wells installed by Hexcel's environmental consultant, two of which were located on the Subject Site prior to the fire/explosion.

Ten shallow monitoring wells were installed and sampled on the Subject Site and adjacent properties in January 1997. The wells were installed and developed in accordance with NJDEP

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soil cleanup criteria using a risk management standard of 10^{-5}. As a results, Napp and ENSR reserve the right to propose alternative cleanup levels.

regulations. The wells were sampled two weeks after development. Three well volumes of groundwater were purged from each monitoring well using low flow purge techniques. Samples were collected from each well using laboratory decontaminated teflon bailers. Samples and analytical parameters are included on Table 4-1 and discussed in Section 5.0. Monitoring well locations are identified on Figure 4-2. Sampling was conducted in accordance with the May 1992 NJDEP FSPM.

4.2 Quality Assurance/Reliability of Analytical Data

4.2.1 Quality Assurance Procedures

The following is a summary of quality assurance protocols pertaining to equipment decontamination, quality assurance samples, and analytical methodologies. Analytical methods and quality assurance samples are summarized on Table 4-4 Analytical Methods/Quality Assurance Summary.

All sampling equipment was constructed of inert materials such as teflon or stainless steel. The following decontamination sequence was employed:

- Non-phosphate detergent plus tap water wash
- Tap water rinse
- Distilled/deionized water rinse
- Total air dry
- Distilled/deionized water rinse

Laboratory-prepared containers were used for all samples, blanks, and duplicates. All containers were clearly labeled and sent to the laboratory under a chain-of-custody (COC) document. Field blanks were collected at a frequency of 10% of the total samples collected and for each matrix sampled. A minimum of one field duplicate was collected for every 20 samples collected, for each matrix sampled.

Soil samples were obtained using stainless steel trowels, hand augers, and split-spoon samplers. Split-spoon samplers were provided by the drilling company. Groundwater samples were obtained using laboratory-cleaned teflon bailers.

Field blanks were obtained by pouring laboratory supplied, analyte-free water over and/or through the implements (e.g., stainless steel trowels, bowls, and hand augers) involved in the sampling chain. A trip blank was provided by the laboratory, and was kept with the water samples.

A total of 38 field blanks were collected during the sampling events conducted from May 1995 through January 1997. A total of five trip blanks were analyzed in connection with sampling activities involving analysis of VOCs in water and the groundwater sampling activities conducted on January 28 and 29, 1997. Analytical results for the field and trip blanks are summarized on Table 4-5 and 4-6, respectively.

4.2.2 Reliability of Analytical Data

Analysis of all samples collected by ENSR was performed by Envirotech Research, Inc. (NJDEP Certification No. 12543) and Integrated Analytical Laboratories, Inc. (NJDEP Certification No. 14751). The analyses were performed in accordance with EPA-approved analytical protocols as indicated on Table 4-4 Analytical Methods/Quality Assurance Summary. Quality Assurance analytical measures were in accordance with the NJDEP TRSR and complied with the requirements for a NJDEP certified laboratory.

Data validation was conducted by ENSR in accordance with NJDEP Standard Operating Procedures (SOPs) Quality Assurance Data Validation of Analytical Deliverables -TCL- Organics (SOP No. 5.A.13) and Quality Assurance Data Validation of Analytical Deliverables -TAL- Inorganics (SOP No. 5.A.02). In general, results were valid and acceptable for decision-making purposes. Quality assurance qualifiers are identified on the data summary tables in Section 5.0.

In general, the data generated were found to be reliable and acceptable for use. All samples, with the exception of one soil sample (S-1) and one field blank (FB-628), met the established holding times. These two samples were qualified as estimated. Selected samples required dilution because of concentrations of target and non-target analytes; sample detection limits for these samples were elevated accordingly. No detection limits were elevated without sufficient cause. In general, the precision and accuracy objectives, as measured by blanks, spikes, and duplicates, were met. For selected samples, quality control criteria were not met for surrogate recoveries, matrix spike results, and internal standard performance. Data for these samples were qualified as estimated, or in a limited number of cases, rejected. Data rejected did not include samples used for delineation purposes. Duplicate samples demonstrated good agreement overall. The relatively few compounds that exceeded the precision criteria were qualified as estimated. Data completeness was calculated by comparing the number of valid data points (i.e., those not rejected during the validation process) to the total number collected. Greater than 99 percent completeness was achieved.

4.3 Overall Nature of Contamination

Various areas of surface, subsurface, and groundwater contamination have been investigated

at the Subject Site. The vast accumulation of contaminated residual material which existed within the on-site trench system, possibly due in large measure to discharges from previous property owners, has been removed and disposed of off-site. These numerous and extensive removal actions conducted to date represent a significant effort by Napp to achieve proper closure under the ISRA program.

Surface and subsurface contamination does remain on-site. In summary, the remaining contamination can be characterized as follows:

a. Soil - Areas of surface soil contamination have been identified on-site. Subsurface soil areas, including areas within the historic fill strata, have been identified as contaminated.

b. Groundwater - Groundwater sampling has indicated that groundwater contamination, and possibly LNAPL and DNAPL exist within the site boundaries.

Specific discussions of each PAEC are included in Section 5.0 of this report.

4.4 Influence of Significant Events or Seasonal Variation on Sampling Procedures and/or Analytical Results

To date there has not been any documented significant event or seasonal variation at the Subject Site that would affect sampling procedures. There has not been any significant event or seasonal variation that would affect analytical results.

4.5 Treatability Studies

To date, treatability, bench scale, or pilot studies have not been performed. If, after completion of the remedial investigation, any active remedial action is deemed necessary, a Remedial Action Workplan will be completed for the Subject Site. If the Remedial Action Workplan calls for a specialized treatment process for remediation, Napp will conduct the appropriate treatability, bench scale, or pilot studies at that time.

4.6 Permits

To date, data have not been specifically obtained for the purpose of remedial permit applications. However, if such data are required for activities to be conducted during remediation, Napp will obtain such data at the appropriate time.

4.7 Ecological Assessments

At the request of the EPA and NJDEP, toxicological testing was conducted on two river sediment samples collected on May 2, 1995. The sampling and analytical results are discussed in Section 5.20.4.

5.0 INVESTIGATION RESULTS

This section presents findings and recommendations in accordance with N.J.A.C. 7:26E-4.9(b)4.

5.1 Remedial Investigation Summary

The remedial investigations performed to date have been conducted in three phases. Phase I sampling was conducted from April through December 1995, with most of the sampling occurring immediately following the explosion. This sampling was intended to provide a general characterization of the surrounding conditions, and, in some cases, samples were collected by or at the direction of the NJDEP and/or local officials. During this phase, many samples were collected that include, but are not limited to, samples for waste classification for materials removed from the Subject Site, soils outside the perimeter of the Subject Site, Saddle River sediments and surface water, selected groundwater monitoring wells installed by Hexcel, potable drinking water supplies, storm and firewater runoff, samples of firefighter equipment, as well as air samples. This initial data was used to assess the impact of the fire and explosion on the Subject Site and the area surrounding the Subject Site. This data indicated the fire and explosion did not have a significant impact on environmental media at the Subject Site and the surrounding area. Accordingly, the results contained herein include only data deemed relevant to the ISRA project (i.e. soils, surface water and sediment sampling results, ground water results, etc.) and exclude "non-relevant data" (i.e. samples of firefighter equipment, etc.).

The Phase II remedial investigation was conducted primarily from February through August 1996. Sampling during this phase was conducted in accordance with the RIW, and consisted of samples from site soils associated with the identified PAECs, as well as waste classification sampling and an extensive trench investigation. Sampling activities proposed in the RIW were appropriately modified based upon the comments made by the NJDEP during the May 7, 1996 meeting and May 15, 1996 site inspection.

The Phase III remedial investigation was conducted from September 1996 through February 1997, and generally consisted of delineation of contamination found in Phase II. The Phase III investigation also included installation and sampling of 10 shallow groundwater monitoring wells. The results of field investigation activities conducted through February 1997, as well as conclusions and recommendations for each PAEC, are presented in subsequent sections of Section 5.0.

Soil results were evaluated based upon NJDEP IGSCC. Because a Presumptive Remedy consisting of selected source area soil excavation followed by total site capping is currently anticipated for the Subject Site, the sampling data and delineation sampling previously conducted and proposed are presented primarily with respect to NJDEP IGSCC. Groundwater results were evaluated based upon the Ground Water Quality Standards[11] under N.J.A.C. 7:9-6.

Summary tables of analytical results have been prepared for each PAEC discussion (5-2 through 5-71 and H-1 through H-5 (Appendix H)). A complete set of analytical data packages is presented as Appendix F (Soils/Sediments/Residuals/Solids) and Appendix G (Groundwater), provided under separate cover. Sample locations are shown on Figures 4-1 and 4-2. Figures 5-2, 5-3, 5-4, 5-5, 5-8, 5-9, and 5-12 include a summary of parameters detected above the applicable NJDEP soil cleanup criteria or GWQS. Data tables for each PAEC appear following the text of this document. A summary of samples collected is presented in Table 4-1, Summary of Sampling Activities.

5.2 Parameter Selection

As discussed in detail in the RIW, ENSR developed a suite of parameters for analysis of most of the samples obtained during the investigation. This suite of parameters was developed following review of Napp's Material Safety Data Sheets (MSDSs) and Community Right to Know

[11] For discussion purposes and data analysis, the analytical results are presented in comparison to the New Jersey Groundwater Quality Standards (GWQS) for Class II-A aquifers, NJAC 7:9-6, as modified by N.J.A.C. 7:26E-4.1(b) (readopted May 19, 1997). However, it should be noted that neither Napp nor ENSR necessarily agrees that these standards form an appropriate basis for the cleanup of groundwater at the Subject Site in order to be protective of human health and the environment. In general, these standards are based on a risk factor of 10^{-6}. ENSR/Napp believe these values to be overly conservative and unnecessarily restrictive, given site conditions. As required by NJSA 58:10B-12(a), remediation standards must take into consideration the location of the property being remediated, the surroundings, the intended use of the property, potential receptor exposure to the discharge, and the surrounding ambient conditions whether naturally occurring or man-made. New Jersey's Groundwater Quality Standards do not take these site specific factors into consideration. Additionally, the Environmental Risk Assessment and Risk Management Study Commission, established in 1993 by the Legislature, was given the charge, "to examine and assess the scientific basis for selecting the risk management standard of one in a million... and to examine and assess the methodologies of risk assessment and their efficacy and applicability for the purpose of establishing remediation standards." Based on a Draft Report of the Environmental Risk Assessment and Risk Management Study Commission, the use of the 10^{-6} guideline as a remediation standard should not be globally applied in all risk management situations. The Commission recommends use of a risk management standard of 10^{-5}. Therefore, Napp/ENSR reserves the right to propose alternative concentration limits at a later date.

Survey Forms, as well as a review of available product sheets. Beginning with Phase II, the Full Scan included the following compounds:

- Target Compound List (TCL) volatile organic compounds plus library search (VOC+10),
- TCL base/neutral and acid extractable organic compounds plus library search (BNA+20),
- methanol,
- ethylene glycol,
- diethylamine,
- diethanolamine,
- ethylamine,
- acetic acid,
- aluminum,
- cadmium,
- calcium,
- chromium,
- cobalt,
- copper,
- lead,
- manganese,
- potassium,
- silver,
- sodium,
- vanadium,
- zinc,
- cyanide,
- nitrate,
- sulfate,
- chloride,
- PCBs,
- TPHC,
- ammonia,
- and pH.

This Full Scan was used until July 15, 1996. At that time, data obtained throughout the Subject Site was evaluated. ENSR determined that the alcohols and non-priority pollutant metals did not appear to be present in significant quantities in any locations. Therefore, Full Scan samples collected after July 15, 1996 were analyzed for a "Modified Full Scan", consisting of the following compounds:

- TCL VOC+10,
- TCL BNA+20,
- priority pollutant metals,
- PCBs,
- TPHC,
- ammonia,
- nitrate,
- cyanide,
- chloride,
- ~~ammonia,~~
- and pH.

In response to NJDEP's October 1, 1996 letter, the Modified Full Scan was replaced by PP+40 as of October 1996. However, going forward, ENSR and Napp propose to modify this requirement to exclude pesticides/herbicides since there is no reason to believe that these compounds are a concern at the Subject Site.

All samples, sample locations, sample depths and parameters analyzed are presented in Table 4-1. Due to the extensive number of samples collected at this site, Table 4-1 also contains a grid designation for each sample location that corresponds with the grid and sample locations on Figures 4-1 and 4-2.

5.3 Historic Fill and Regional Contamination Investigation Results

Table 5-1 summarizes the results of the file reviews conducted to date as previously discussed. This table includes all sites listed on the NJDEP Known Contaminated Sites list for the Borough of Lodi, potable public supply wells in the Lodi area that have been closed per an EPA Record of Decision (ROD), and potentially/known contaminated sites identified by the Army Corps of Engineers (ACOE). Figure 1-3 Regional Contamination Map graphically depicts the distribution of sites within one mile of the Subject Site. In summary, contaminants found at these sites in soils and/or groundwater include, but are not limited to, volatile and semi-volatile organic compounds, metals and PCBs. As previously discussed, the Lodi Municipal Wellfield has been closed due to the presence of chlorinated volatile organic compounds which the USEPA attributed to a regional problem with an unknown source or multiple sources. The USEPA approved a plan of no further action for the Lodi wells, but recommended that the groundwater not be used as a potable water supply without appropriate treatment. This information documents the existence of a regional contamination problem in the area surrounding the Subject Site.

5.3.1 Historic Fill/Regional Contamination in Vicinity of the Subject Site

5.3.1.1 Off-site Soil Sampling

Following the April 21, 1995 incident, the NJDEP Emergency Response Coordinator requested a general characterization of the surroundings, specifically to include analysis for phenol, VOCs, BNs, PCBs, and metals. Sample locations and analytical parameters were developed based upon recommendations of the NJDEP. As indicated on Figure 1-3 and Table 5-2, off-site soil samples were collected in May 1995, both upgradient (PL-1 and PL-2) and downgradient (OS-1 through OS-4) of the Subject Site. The upgradient samples were collected along the edge of the Fine Organics property (formerly Hexcel), and showed no visual evidence of being impacted by the fire/explosion. The downgradient sample locations were biased to "worst case" locations, and were collected from areas that appeared to have been potentially affected by the fire/explosion.

Samples selected as "worst case" were chosen based upon visual and olfactory observations. These locations exhibited characteristics indicative of potential contamination. However, none showed conclusive evidence of having been impacted by the fire/explosion. Sample OS-1 was selected due to the presence of blackened soil. The area was surrounded by miscellaneous debris, including cinder blocks and concrete fragments. The sample exhibited a slight petroleum-like odor. Apparent visual petroleum-like contamination was noted to a depth of 2 feet bgs. The area immediately surrounding sample OS-2 was observed to contain small fragments of potentially burned material. Sample location OS-3 showed no visible signs of contamination. Sample OS-4 was collected from dark organic topsoil, located adjacent to a black-stained wall of the former Saddle River Tours building on the Fortunato property.

Both upgradient and downgradient data indicate the presence of various PAH compounds and PCBs above the NJDEP RDCSCC and NRDCSCC. Constituents detected, as well as relative concentrations, are comparable for the upgradient and downgradient sample locations. This demonstrates that the detected contamination is not due either to normal operations or to the fire/explosion at the Napp facility. For example, as indicated in Table 5-2, detections for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and benzo(k)fluoranthene are 1 to 2 parts per million (ppm) higher in the upgradient samples than the detections in the downgradient samples. The PCB concentration for one of the two upgradient samples (PL-2) is significantly higher (240 ppm) than the concentration for any of the four downgradient samples (less than 12 ppm).

In addition, samples were collected by EMS, an environmental consultant for Robert Fortunato, at the adjacent property downgradient from the Subject Site. The off-site sample results indicate

elevated PAH levels. Additional information concerning these samples is currently being obtained. Based on the results of these samples, it can be concluded that the Subject Site is not the source of these contaminants.

These results also support the conclusion that the Subject Site and surrounding area are impacted by historic fill and/or regional contamination unrelated to Napp's operations. PAH compounds and PCBs were not identified as a potential contaminant of concern based on ENSR'S review of the inventory of material used in Napp's operations. The PAHs and PCBs detected in upgradient and downgradient soil samples may be the result of regionally affected river sediments that have been deposited along the shoreline and were historically present in fill materials used in previous site development along the river, or are from historic operations.

5.3.1.2 NJDEP File Reviews

As part of the evaluation of the existence of a regional contamination problem in the area of the Subject Site and whether the Subject Site is underlain by contaminated historic fill, Napp, ENSR and Lowenstein, Sandler, et al have conducted a review of environmental data for nearby properties along the Saddle River. Based upon this review, it is clear that a regional soil contamination problem exists within the vicinity of the Subject Site. Several metals, (primarily arsenic, cadmium, antimony, lead), in addition to numerous polynuclear aromatic hydrocarbon (PAH) compounds, (e.g., benzo(a)pyrene, benzo(a)anthracene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(b)- and benzo(k)fluoranthene) have been documented at concentrations exceeding NJDEP RDCSCC and NRDCSCC at locations both upgradient and downgradient of the Subject Site. According to Napp personnel, PAH compounds, as well as cadmium and antimony, were not used at the Subject Site and were not associated with Napp's operations. Napp utilized arsenic and lead salts in minimal quantities as reagents (less than 1 pound of total reagents) in the facility's laboratory processes.

Of significant note is the Rellim Properties site (139-161 Main Street) located at the southern end of the block at which the Subject Site is located. Vertical delineation of PAHs in the soils at the Rellim Properties site indicates the presence of these PAH compounds at depths ranging from 1 to 5.5 feet bgs at concentrations exceeding NJDEP RDCSCC and NRDCSCC. The remedial investigation report prepared by Environmental Compliance & Control, Inc. (ECC) for the Rellim Properties site concludes that the presence of these compounds is not directly related to discharges at the Rellim site, but due to the presence of historic fill generally found in Lodi's industrial areas. A Declaration of Environmental Restrictions (DER) was submitted to the NJDEP in April 1996. The DER characterizes the entire Rellim property (with the exception of areas which were excavated and backfilled with clean fill) as restricted due to historic fill contamination with metals and PAH concentrations exceeding both NJDEP RDCSCC and NRDCSCC.

The appendix to the DER submittal also included Classification Exception Area (CEA) documentation. The CEA document was submitted to address the presence of arsenic concentrations exceeding GWQS for Class II Aquifers detected in two on-site groundwater monitoring wells. ECC's submittal to NJDEP concluded that the presence of arsenic in subsurface soils at Rellim and adjoining sites is generally reflective of historic fill characteristics common to this area of industrial Lodi. As a result, shallow groundwater throughout the area is subject to intermittent impacts resulting from the overlying historic fill that is located in this area.

ECC's comparison of Rellim analytical data with sampling results related to site development of the Walgreens located at 20 Arnot Place, directly across Graham Lane from the Rellim property, confirms the widespread distribution of historic fill. Based on available historical information concerning the Walgreens site, ECC assumes that subsurface materials (e.g., metal slag and coal ash) encountered were associated with prior industrial operations performed at the Walgreens site by UPDW. Comparison of detected levels of metals (As, Cd, Sb, Pb), as well as PAHs, (benzo(a)pyrene, benzo(a)anthracene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, benzo(b)- and benzo(k)fluoranthene) in soils at the Rellim Properties and Walgreens sites, reveals similar concentrations of these compounds at both sites. A DER was also executed for the Walgreens site, and NJDEP's no further action approval was granted in December 1994.

Review of NJDEP's ISRA file for the adjacent Hexcel facility (currently Fine Organics) also documents that contamination at the Subject Site is due, in part, to sources other than Napp's operations. The Hexcel site is extensively contaminated with many compounds including chlorobenzene (not used by Hexcel based on review of NJDEP's files) and PCBs (predominantly Aroclor 1242 and 1248). A review of information obtained from the NJDEP file review also indicates that the surface soil at the former Hexcel facility contains substantial quantities of fill material[12].

A general comparison of soil data collected at the Napp and Hexcel sites during the ISRA investigations at both sites indicates that many of the same volatile organic compounds are detected in the unsaturated soil at each site. This limited comparison, summarized in Table 5-2A, is indicative of a historic contamination source or regional soil contamination most likely from the former UPDW facility.

A general comparison of the groundwater data collected at the Hexcel site in July 1993 to the first round of groundwater data collected at the Subject Site in January 1997 was conducted.

[12] ENVIRON Corporation, November, 1988.

This comparison, summarized in Table 5-2B, shows that many of the same volatile organic compounds are detected in the shallow groundwater at both sites. The volatile organic compounds detected are found in similar ratios on each site indicating there may be a common source unrelated to the specific operations of Napp or that the contamination is due to historic regional contamination. The presence of historic regional contamination is supported by the fact that contaminants found at both the Subject Site and Hexcel site include compounds reportedly not used by Napp or Hexcel (e.g., PCBs, chlorobenzene[13], etc.)

Regional groundwater contamination has been documented throughout the Borough of Lodi. The Lodi Municipal Wells site consists of nine public wells interspersed in a heavily populated industrial and residential area within the Borough of Lodi. The site is currently listed on the National Priorities List and the list of Known Contaminated Sites in New Jersey. Some of these wells have exhibited radiological and volatile organic (VOC) contamination resulting in the closure of the Lodi Municipal Well Field. According to an October 15, 1992 letter from Killam Associates (on behalf of Hexcel) to NJDEP, this contamination resulted in the closure of the municipal wellfield during the period of 1981 through 1987. The contamination has impacted 4-square miles of residential/industrial property in the area.

Regional contamination is evidenced at other sites in the area of the Subject Site. As an example, a Phase I environmental site assessment of the nearby former United Piece Dye Works Powerhouse, located on Arnot Street, was reviewed. According to this assessment, a round of groundwater sampling at the site conducted in October 1989 indicated that tertiary butyl alcohol (TBA), methyl tertiary butyl ether (MTBE), trichloroethene, dichloroethene, and vinyl chloride were detected in an upgradient well.

The review of area property files, in addition to revealing consistent environmental contamination, also indicates a common structural element. The Rellim site has been documented to contain a trench system with similar characteristics to the historic trench system found at the Subject Site. In the report Response to BEECRA Inquiry for Rellim Properties, Inc., dated January 1994, ECC discusses the results of a site investigation regarding floor drains, trenches, metal plates, and patches (section B of the report). In the report ECC states "A floor trench in room III occupied the center of the room as depicted in Appendix B-Figure 1. This inactive trench was 1.5 feet wide and varied in depth from 7 inches in the northernmost section to 13 inches to the south and east." These trench dimensions are similar to those found at the Subject Site, as indicated in Figure 5-6. ECC continues to describe the inactive trench as follows: "The trench contents consisted of loose concrete, dusty sediments and miscellaneous domestic debris such

[13] An extensive evaluation of compounds used by Napp indicates no record of PCB use; only de minimis laboratory quantities (less than 10 pounds) of chlorobenzene were used.

as paper and soda cans"(ECC, pg.4), and "Toward the bottom of the trench, however, these sediments were compacted and hardened"(ECC, pg.4). ECC also investigated the outlet for the trenches and noted that "No discharge outlets were found for those trench sections which had not been previously filled. It is probable that these remaining sections had been connected to the now sealed trench sections which had been closed an undetermined number of years previous."(ECC, pg.5).

As both the Rellim site and the Subject Site are part of the former UPDW facility it is reasonable to conclude that the trenches observed extending beyond the Subject Site in a southerly direction continue to the Rellim property and beyond. Moreover, the Hexcel site has also been documented to contain a trench system. The Hexcel site is also part of the former UPDW facility, which further documents that the Subject Site and adjacent properties were part of a large industrial complex, and that historic trench systems may exist at other locations within the former dye works. As further discussed in this report, significant contamination discovered at the Subject Site likely is associated with the former dye works. This supports the conclusion that significant contamination at the Subject Site results from historic operations unrelated to Napp.

5.3.2 Analytical Documentation of On-site Historic Fill/Regional Contamination

The Subject Site is underlain by significant quantities of historic fill. As indicated on the borings logs presented in Appendix D, the soils at a majority of borings on the Subject Site exhibit the characteristics of dredged river sediments and/or debris-type fill. Specifically, sand and gravel river sediments, with intermingled brick, wood, and miscellaneous debris have been found throughout the Subject Site.

Analytical data for the Subject Site indicate the presence of various heavy metals, including arsenic, cadmium, chromium, copper, and nickel, in soils. Concentrations of these compounds vary, but exceed the NJDEP NRDCSCC in several locations. Significantly, the concentrations of arsenic, cadmium, lead, and zinc detected at the Subject Site are within the range of concentrations for historic fill incorporated in the TRSR as Table 4.2. The heavy metals are not known to have been used extensively at the Subject Site, but are common to historic fill. Moreover, these metals have been detected at several other sites in the area including Academy Auto Recyclers (located to the west across the Saddle Brook), Walgreens, Rellim, and Hexcel. Table 5-1 summarizes the soil contamination documented from file reviews of other sites in the area. Additionally, a study conducted by Rutgers University[14] to evaluate the effects of urban runoff on the Saddle River found that there is a substantial amount of metals contamination

[14] Water Resources Institute, Rutgers University, "Characterization of Urban Runoff - New Jersey", June 1976

throughout this river, including cadmium, chromium, copper, lead, mercury, nickel, and zinc. Based upon the data obtained, as well as the known historic contamination of the river, ENSR believes that the metals contamination on the Subject Site is primarily due to historic fill and/or prior site operations, rather than to Napp's process-related activities.

Napp did not use or store PAH compounds at the Subject Site. Nonetheless, sampling conducted during Phases II and III indicated the presence of PAH concentrations above NJDEP RDCSCC in approximately half of the soil samples collected to the west of the facility buildings. These samples were obtained from random locations, including relatively small pavement cracks, with no evidence of impact from the Subject Site. The PAH concentrations in these samples are similar in magnitude to those found in the upgradient and downgradient off-site samples. Additionally, all of the PAH concentrations fall within the range identified by NJDEP in Table 4-2 of the TRSR (Readopted May 19, 1997) as typical of historic fill material. Based upon the data obtained by ENSR, NJDEP's historic fill database, and the presence of apparent fill material at the Subject Site, it has been determined that the PAH contamination at the Subject Site is primarily due to historic fill and/or historic operations, rather than to Napp's process-related activities.

In accordance with N.J.A.C. 7:26E-4.6(b) (Readopted May 19, 1997), ENSR has identified the approximate location of fill material on the Subject Site. Two cross-sections for the Subject Site have been prepared and are presented as Figure 5-1. Soil characteristics vary across the Subject Site, but in general the fill at the Subject Site appears to exist over the entire Subject Site to a depth of at least the water table.

Based on ENSR's evaluation of the results of the extensive environmental sampling conducted by Napp, there appears to be historical contamination throughout the Subject Site unrelated to Napp's operations. This contamination includes predominant compounds such as polychlorinated biphenyls (PCBs) and chlorobenzene which are not believed to be associated with Napp's operations. In addition, much of this contamination does not appear to be associated with specific PAECs identified during the PA but is concluded to be associated with historic industrial activities long before Napp started operations in the early 1970's.

N.J.S.A. 58:10B-12(h) established a rebuttable presumption that it is not necessary to remove or treat historic fill material in order to comply with a remediation standard. As previously discussed, Napp proposes to cap the area to prevent direct contact, and to include the fill area in the DER for the Subject Site. This cap is consistent with engineering controls typically used to address contaminated historic fill. Specific hot spot areas containing constituents of concern other than those found in the fill (i.e. phenol, VOCs) will be addressed independently of the historic fill material. This strategy has been applied to the specific proposals for each PAEC,

which are identified below.

5.4 Strategy for Further Delineation/Investigations

As discussed in Section 1.0, the presumptive remedy for the Subject Site is site-wide capping, augmented by limited source area soil remediation, recording of a DER for the remaining soils and establishment of a CEA for groundwater. In order to complete this remedy, additional delineation will be conducted as described below.

5.4.1 Soil

Napp's proposal for additional limited sampling is based upon the following criteria:

- Due to the historic fill issue, no additional sampling will be performed to delineate PAHs or metals. As the Subject Site will be capped, additional sampling for these parameters is not necessary.

- Soil sampling will be conducted to delineate VOCs, PCBs, and phenol to NJDEP IGSCC levels. As allowed in N.J.A.C. 7:26E-4.1(b) (readopted May 19, 1997), delineation to NJDEP RSDCCC or NRDCSCC is not necessary because the cap will eliminate direct contact concerns and a DER will be established for the Subject Site. This position of delineation only to NJDEP IGSCC when engineering controls are proposed previously was utilized by NJDEP (see Ronald T. Corcory's letter of March 6, 1995 to DuPont, Merck & Co., Inc., and Cytec Industries. A copy of this letter is included in Appendix E.)

- In general, soil borings will be installed to the saturated zone or silt/clay layer (depending on the contaminant being delineated). Samples will be collected at pre-determined intervals. Samples nearest the location where the concentration currently exceeds NJDEP IGSCC will be analyzed by the laboratory with a one-week turnaround time for results. Chemical analysis of the next interval(s) will be performed only if the results of the initial sample(s) exceeds NJDEP IGSCC.

- In consideration of the physical properties of PCBs, vertical soil delineation for PCB contamination will continue into the saturated zone as per N.J.A.C. 7:26E-4.1(b). If required, sampling will continue to the silt/clay (confining) layer. Sample borings will not be advanced intentionally through the silt/clay layer so as to minimize the possibility of creating a downward pathway for contaminant migration. In the unlikely event PCBs are found immediately above the silt/clay layer, this layer will be assumed to be a

physical barrier for purposes of vertical delineation in accordance with the variance request included in Appendix A.

- With respect to the physical properties of VOCs and phenol, as indicated in the variance request provided in Appendix A, in accordance with N.J.A.C. 7:26E-4.1(b), vertical soil delineation for these compounds will not be conducted into the saturated zone. In light of the planned municipal redevelopment of the Main Street area, remediation of VOC and/or phenol compounds by in-situ treatment technologies even if technically feasible or removal by excavation would not be cost-effective. Therefore, sampling in the saturated zone will not provide useful data. If VOCs or phenol is found at the interval immediately above the watertable or immediately above the silt/clay layer (based on the proposed groundwater investigation discussed below), the silt/clay layer will be designated as a physical barrier for purposes of vertical delineation in accordance with the variance request included in Appendix A, and sample borings will not be advanced beyond the upper limit of the silt/clay layer (to the degree reasonably possible) to minimize the possibility of creating a downward pathway for contaminant migration.

- Soil delineation activities will be implemented and completed prior to additional groundwater investigations. Thereafter, if additional soil delineation is needed, additional soil samples can be collected during the installation of the soil borings/monitoring wells described below. As a result, the indicated locations of soil borings proposed in this report may be subject to modification.

As previously discussed, ENSR has conducted extensive environmental investigations at the Subject Site. In many cases, in accordance with various sections of the TRSR, decisions related to collection of soil samples have been based on visual inspection and evaluation of the structural integrity of various structures. For example, in accordance with N.J.A.C. 7:26E-3.9(d)1.iii, drainage system integrity can be documented by various specified regulatory methods or other methods approved on a case-by-case basis by NJDEP. Based on our experience, due to the subjective nature of structural integrity evaluations and site specific conditions of many of the historic drainage system components (i.e. subsurface structures difficult to access, poor lighting, etc.), it is not reasonably possible to provide video documentation of a quality that Napp and ENSR believe would document actual conditions and/or would be acceptable to the NJDEP. As a result, Napp and ENSR recommend that a joint inspection be conducted with NJDEP to evaluate the structural integrity in locations where adequate integrity is being used as the rationale for no further action. This proposal is in accordance with the requirements of N.J.A.C 7:26E 1.6(c).

The above objectives will be accomplished by implementation of the investigation activities discussed in Sections 5.5 through 5.32.

5.4.2 Groundwater

Additional groundwater investigation is being proposed. The purpose of the additional sampling is to further characterize the groundwater in the following ways:

- The existence and potential location of LNAPL at various locations at the Subject Site.
- The existence and potential location of DNAPL at various locations at the Subject Site.
- Evaluation of the subsurface geology and silt/clay layer.
- The general quality of groundwater entering the Subject Site and in the watertable aquifer and the confined unconsolidated aquifer.
- The groundwater flow direction and hydraulic gradient across the Subject Site in the watertable aquifer and confined unconsolidated aquifer.

The above objectives will be accomplished by implementing the geoprobe investigation, monitoring well installation, and groundwater sampling activities presented herein.

5.5 PAEC A: Tank Farm

The former aboveground storage tank area is located to the west of the Manufacturing Building. The area is approximately 95 feet by 25 feet, and contained five tanks. All tanks have been removed from the Subject Site. The former tanks included within this PAEC are described in sections 5.5.1 through 5.5.8.

5.5.1 PAEC A1: 6,000-Gallon Methanol Tank

5.5.1.1 Area Description

This tank was constructed prior to 1971. Previous contents included fuel oil, sulfuric acid, and isopropyl alcohol. The tank shared a concrete secondary containment basin with the potassium hydroxide tank (PAEC A2). The previous containment history of the methanol tank is unknown, but the potassium hydroxide tank is known to have been uncontained prior to 1977. Therefore, it is likely that the methanol tank was also without secondary containment until that time. The

area is believed to have been paved prior to 1977, but the condition of the pavement at that time is not known.

The secondary containment system drained directly into a pipeline which was connected to the facility wastewater treatment system. In its October 1, 1996 letter, NJDEP asked for documentation of the integrity of this piping. However, NJDEP TRSR, N.J.A.C. 7:26E-3.9(a)2.i requires that for aboveground storage tanks within a paved secondary containment area, sampling at the drainage points be conducted pursuant to N.J.A.C. 7:26E-3.9(d). Moreover, the pipeline is part of a stormwater collection system for the tank's secondary containment area. For collection systems, N.J.A.C. 7:26E-3.9(d)1 requires documentation of collection system integrity and sampling below collection system laterals if there is reason to believe contaminants were discharged into the collection system.

There is no record of a release of hazardous material from the tank into the secondary containment system, and, based on visual inspection, no discharge from the tank is evident. In addition, sampling below the tank, discussed below, did not reveal any evidence of a discharge from the tank that resulted in unacceptable levels of contamination. Therefore, no further action relative to the collection system piping is proposed.

Product piping from this tank into the manufacturing building was aboveground and crossed a paved parking area. There is no reported release of hazardous materials from this piping system. In accordance with N.J.A.C. 7:26E-3.9(a)4.i sampling below this pipeline is not required.

5.5.1.2 Phase II Sampling Program

Sampling below the tank secondary containment system was conducted consistent with N.J.A.C. 7:26E-3.9(a)2.ii. ENSR collected one sample (A1-1) from beneath the former secondary containment basin of the tank on April 22, 1996. The sample location was selected near visible hairline cracks in the containment basin. Table 4-1 and Figure 4-1 provide the sample location. The sample was analyzed for methanol, TPHC, total sulfates, target compound list (TCL) VOCs + 10, PAHs, and pH.

The analytical results for the sample collected from this area of concern are provided in Table 5-3. No constituent was detected at concentrations above the NJDEP IGSCC, therefore no further action was taken with respect to this PAEC.[15]

[15] The results of sample (A1-1) also are below the RDCSCC and NRDCSCC.

5.5.1.3 Conclusions and Recommendations

As confirmed through soil sampling and visual inspection, there is no evidence that a spill, if any, from this tank has negatively impacted the soils beneath the containment structure. No further action is proposed for this PAEC.

5.5.2 PAEC A2: 6,000-Gallon Potassium Hydroxide Tank

5.5.2.1 Area Description

This tank was constructed prior to 1971 and was taken out of service in approximately 1993. All hazardous materials were removed, and product piping systems were disconnected and blank-flanged at that time. Previous contents included ammonium hydroxide (aqua ammonia), ethyl acetate and fuel oil. The tank shared a concrete secondary containment basin with the methanol tank (PAEC A1), and did not have secondary containment until 1977. The area is believed to have been paved prior to that time, but the condition of the pavement is not known.

The secondary containment system drains directly into a collection system pipeline which was connected to the facility wastewater treatment system. In its October 1, 1996 letter, NJDEP has asked for documentation of the integrity of this piping. However, N.J.A.C. 7:26E-3.9(a)2.i requires that for aboveground storage tanks within a paved containment area, sampling at the drainage points be conducted pursuant to N.J.A.C. 7:26E-3.9(d). Moreover, the pipeline is part of a stormwater collection system for the tank secondary containment area. For collection systems, N.J.A.C. 7:26E-3.9(d)1 requires documentation of collection system integrity and sampling below collection system laterals if there is reason to believe contaminants were discharged into the collection system. There is no record of a release of hazardous material from the tank into the containment system. In addition, sampling below the tank, discussed below, did not reveal any evidence of a discharge from the tank resulting in unacceptable levels of contamination. Therefore, no further action relative to the discharge piping is proposed.

Product piping from this tank into the manufacturing building was aboveground and crossed a paved parking area. There is no reported release of hazardous materials from this product piping system. In accordance with N.J.A.C. 7:26E-3.9(a)4.i, sampling below this pipeline is not required.

5.5.2.2 Phase II Sampling Program

Sampling below the tank secondary containment system was conducted in accordance with N.J.A.C. 7:26E-3.9(a)2.ii, as described below. ENSR collected one sample (A2-1) from beneath

the former secondary containment basin of the tank on April 22, 1996. The sample location was selected near visible hairline cracks in the containment basin. Table 4-1 and Figure 4-1 provide the sample location. The sample was analyzed for potassium hydroxide, ethyl acetate, total ammonia, TPHC, TCL VOCs+10, PAHs, and pH.

The analytical results for the sample collected from this area of concern are provided in Table 5-3. No constituent was detected at concentrations above the NJDEP IGSCC, therefore no further action was taken.[16]

5.5.2.3 Conclusions and Recommendations

As confirmed through soil sampling and visual inspection, there is no evidence that a spill, if any, from this tank has negatively impacted the soils beneath the contaminant structure. No further action is proposed for this PAEC.

5.5.3 PAEC A3: 3,000-Gallon Isopropyl/n-propyl Alcohol Tank

5.5.3.1 Area Description

This tank was constructed prior to 1971. Previous contents included methanol. The tank was equipped with a concrete secondary containment system which was constructed in 1976. The tank was previously uncontained. The area is believed to have been paved prior to that time, but the condition of the pavement at that time is not known.

The secondary containment system drains directly into a collection system pipeline which was connected to the wastewater treatment system. In its October 1, 1996 letter, NJDEP has asked for documentation of the integrity of this piping. However, N.J.A.C. 7:26E-3.9(a)2.i requires that for aboveground storage tanks within a paved containment area, sampling at the drainage points be conducted pursuant to N.J.A.C. 7:26E-3.9(d). The pipeline is part of a stormwater collection system for the tank secondary containment area. For collection systems, N.J.A.C. 7:26E-3.9(d)1 requires documentation of collection system integrity and sampling below collection system laterals if there is reason to believe contaminants were discharged into the collection system. There is no record of a release of hazardous material from the tank into the containment system. Sampling below the tank, discussed below, did not reveal any evidence of a discharge from the tank. Therefore, no further action relative to the discharge piping is proposed.

[16] The results of sample (A2-1) are below the RDCSCC and NRDCSCC.

Product piping from this tank into the manufacturing building was aboveground and crossed a paved parking area. There is no reported release of hazardous materials from this product piping system. In accordance with N.J.A.C. 7:26E-3.9(a)4.i, sampling below this pipeline is not required.

5.5.3.2 Phase II Sampling Program

Sampling below the tank secondary containment system was conducted in accordance with N.J.A.C. 7:26E-3.9(a)2.ii. ENSR collected one sample (A3-1) from beneath the former secondary containment basin of the tank on April 22, 1996. The sample location was selected near visible hairline cracks in the containment basin. Table 4-1 and Figure 4-1 provide the sample location. The sample was analyzed for methanol and isopropyl alcohol.

The analytical results for the sample collected from this area of concern are provided in Table 5-3. Neither constituent was detected in the sample.

5.5.3.3 Conclusions and Recommendations

As confirmed through soil sampling and visual inspection, there is no evidence that a spill, if any, from this tank has contaminated the soils below the containment. No further action is proposed for this PAEC.

5.5.4 PAEC A4: 6,000-Gallon Phenol Tank

This tank was installed in 1984, with a concrete secondary containment system. The tank was removed from service in approximately 1993. All hazardous material was removed, and product piping was disconnected and blank-flanged in 1993. In its October 1, 1996 letter, NJDEP requested clarification of ENSR's statement that the secondary containment system did not have any "significant cracks". The secondary containment system had minor hairline cracks through which a discharge would not be presumed to have migrated. Accordingly, Napp and ENSR propose to include this area in the joint inspection with ENSR/NJDEP as previously discussed in Section 5.4.1.

As testing has been conducted to verify the integrity of this tank, and, as the tank has always been equipped with secondary containment and an impervious base, there is no reason to suspect that a discharge, if any, from this tank would have impacted the environment. As a result, sampling was not proposed or conducted. No additional action is warranted unless the visual inspection indicates otherwise.

The drainage from this system flowed into a collection pipeline which was connected to the facility wastewater treatment system. In its October 1, 1996 letter, NJDEP has asked for documentation of the integrity of this piping. However, N.J.A.C. 7:26E-3.9(a)2.i requires that for aboveground storage tanks within a paved containment area, sampling at the drainage points be conducted pursuant to N.J.A.C. 7:26E-3.9(d). The pipeline is part of a stormwater collection system for the tank secondary containment area. For collection systems, N.J.A.C. 7:26E-3.9(d)1 requires documentation of collection system integrity and sampling below collection system laterals if there is reason to believe contaminants were discharged into the collection system. There is no record of a release of hazardous material from the tank into the containment system. Therefore, no further action relative to the discharge piping is proposed.

Product piping from this tank into the manufacturing building was aboveground and crossed a paved parking area. There was no release of hazardous materials from these product piping systems to the environment. In accordance with N.J.A.C. 7:26E-3.9(a)4.i, sampling below this pipeline is not required.

5.5.5 PAEC A5: 32-Ton Carbon Dioxide Tank

This leased tank was located within a gravel-lined basin with concrete walls. This tank was removed from the Subject Site in 1994. Any potential release from this tank or associated product piping would have been in a gaseous state, and would not have impacted site soils or groundwater. As a result, sampling or further investigations were not proposed or conducted.

The proposal for no further action was accepted by NJDEP in its October 1, 1996 letter.

5.5.6 PAEC A6: 2,000-Gallon Isopropyl Alcohol Tank

5.5.6.1 Area Description

This tank, which was constructed prior to 1971, was removed from the Subject Site prior to 1978. No information is available regarding the containment status of this tank or the presence of pavement beneath the tank at that time.

5.5.6.2 Phase II Sampling Program

Sampling was conducted in accordance with N.J.A.C. 7:26E-3.9(a)2.ii. ENSR collected one sample (A6-1) from adjacent to the former tank location on April 22, 1996. The sample location was selected near visible hairline cracks in the pavement. Table 4-1 and Figure 4-1 provide the sample location. The sample was analyzed for isopropyl alcohol.

The analytical results for the sample collected from this area of concern are provided in Table 5-3. Isopropyl alcohol was not detected in the sample, therefore no further action was taken.

5.5.6.3 Conclusions and Recommendations

As confirmed through soil sampling and visual inspection, there is no evidence that a spill, if any, from this tank has occurred. No further action is proposed for this PAEC.

5.5.7 PAEC A7: 8,000-Gallon Hydrochloric Acid Tank

This tank, constructed of fiberglass reinforced plastic (FRP), was installed in 1988 and replaced a 5,000-gallon tank that was installed in 1971. At that time the 5,000-gallon tank removed from this area of the site was installed as part of the facility wastewater treatment system, discussed below in Section 5.6.

The 8,000-gallon tank was equipped with a concrete secondary containment system with an impervious liner (epoxy coating). Upon inspection, the integrity of the secondary containment area appeared intact. The secondary containment system drained directly into a pipeline which was connected to the facility wastewater treatment system. This secondary containment system was in place when Napp began operations in 1970, and facility personnel indicated that there is no history of a release from this system.

Product piping from this tank into the manufacturing building was aboveground and crossed a paved parking area. There was no release of hazardous materials from these product piping systems to the environment. In accordance with N.J.A.C. 7:26E-3.9(a)4.i, sampling below this pipeline is not required.

As testing has been conducted to verify the integrity of this tank, and as the tank has been equipped with secondary containment and an impervious base throughout Napp's occupancy of the Subject Site, there is no reason to suspect that a discharge, if any, from this tank would have impacted the environment. As a result, sampling or further investigations were not proposed or conducted.

The proposal for no further action was accepted by NJDEP in its October 1, 1996 letter.

5.5.8 PAEC A8: 2,500-Gallon Sodium Hydroxide Tank

5.5.8.1 Area Description

This tank was installed in 1992. The tank, constructed of carbon steel, was equipped with a concrete secondary containment system. This tank replaced an older tank, which was constructed in 1971. According to Napp personnel, the original tank was equipped with secondary containment which was constructed in 1977. Prior to that time, the original tank was uncontained. The area is believed to have been paved prior to that time, but the condition of the pavement is not known. The containment system drainage discharge flowed directly into a pipeline which was connected to the facility wastewater treatment system.

Product piping from this tank into the manufacturing building was aboveground and crossed a paved parking area. There was no release of hazardous materials from these product piping systems to the environment. In accordance with N.J.A.C. 7:26E-3.9(a)4.i, sampling below this pipeline is not required.

5.5.8.2 Phase II Sampling Program

Sampling of the area beneath the former secondary containment was conducted in accordance with N.J.A.C. 7:26E-3.9(a)2.ii. ENSR collected one sample (A8-1) from beneath the former secondary containment basin of the tank on April 22, 1996. The sample location was selected near visible hairline cracks in the secondary containment basin. Table 4-1 and Figure 4-1 provide the sample location. The sample was analyzed for total sodium and pH.

The analytical results for the sample collected from this area of concern are provided in Table 5-3. Sodium was detected in the sample, but was also present in the method blank, and does not appear to be attributable to a spill from the tank.

5.5.8.3 Conclusions and Recommendations

As confirmed through soil sampling and visual inspection, there is no evidence that a spill, if any, from this tank has occurred. In addition, sodium is not included as a contaminant of concern in NJDEP's soil remediation standards. Therefore, remedial actions are not required or proposed.

5.6 PAEC B: Wastewater Treatment System Tanks

5.6.1 Area Description

The wastewater treatment system included two aboveground tanks, both approximately 5,000 gallons, which were used to contain and treat wastewater. Wastewater flowed to PAEC B from two underground pits known as PAECs I1 and I2. The wastewater treatment system was operated in compliance with a Sewer Connection Permit, Permit Number 17401142, from the Passaic Valley Sewerage Commissioners (PVSC). Treatment operations consisted solely of pH adjustment of the wastewater prior to discharge to the PVSC. The wastewater discharged to this system included the following:

- boiler blowdown;
- compressor condensate;
- storm water runoff from the drum storage pad, aboveground storage tank containment systems and hazardous waste storage area;
- floor wash water from manufacturing and processing areas;
- wash water from equipment changeouts which was discharged to drains in manufacturing and processing areas;
- condensate from the non-contact cooling water recirculation system; and
- spills and leaks in the manufacturing and processing areas of the facility.

The primary wastewater treatment tank is situated on a concrete pad which was constructed in 1976. This pad was observed to have good integrity. The second wastewater treatment tank served as an overflow tank. As discussed above (PAEC A7), this tank previously stored hydrochloric acid. Secondary containment was not provided for the overflow tank. However, the overflow tank was generally kept empty and was located within a paved area of the facility.

Because most materials used at the Subject Site were non-hazardous, wastewater discharged to the wastewater treatment system and PVSC would also be expected to be non-hazardous and would not be expected to contain the presence of significant concentrations of contaminants. As indicated on the tables for PAECs I1 and I2 (Tables 5-27, 5-27A, and 5-28), the aqueous and sludge material in these pits contained relatively low parts per billion levels of VOCs, and therefore, would not be expected to pose a significant concern.

In its October 1, 1996 letter, NJDEP requested copies of the wastewater effluent sampling results which were provided in PVSC Pretreatment Monitoring Reports. Copies of the Pretreatment Monitoring Reports from April 17, 1992, January 18, 1994 and April 19, 1995, as well as a copy of the April 19, 1995 Individual Discharge Monitoring Report for Connections 1 and 2, are

provided as Attachment 5 in Appendix B.

5.6.2 Conclusions and Recommendations

Based upon the reported contents of the wastewater treatment system tanks, and the presence of pavement and/or secondary containment, there is no reason to suspect that a potential discharge, if any, would have negatively impacted the environment. As a result, sampling or further investigations were and are not warranted or proposed.

5.7 PAEC C: Non-Contact Cooling Water System

A closed-loop recirculation system consisted of 100- and 125-ton cooling towers, an inactive 40-ton cooling tower, a 10,000-gallon stainless steel recirculating cooling water tank, and an approximately 4,000-gallon non-contact cooling water tank. Another 100-ton cooling tower was located on the roof over the P&B area of the manufacturing building. Non-contact cooling water was utilized for operation of condensers, reactors and compressors associated with manufacturing processes. Prior to this time, once-through non-contact cooling water from these systems was discharged to the facility wastewater collection and treatment systems. Design, construction and operation of this wastewater collection system is detailed in Section 5.9.1.1 of this RIR.

According to a sketch submitted by Napp to the Lodi Building Inspector, the 10,000-gallon stainless steel tank described above may have previously been used for storage of hazardous liquid. However, Napp was unable to verify the former contents of the tank. The 10,000-gallon tank was installed prior to 1977 and the 4,000-gallon tank was installed in 1979. Both tanks were located on a common concrete base with a 6- to 8-inch curb. The surrounding courtyard is also paved. Condensate from these tanks or the cooling tower, also located in this area, discharged into one of two catch basins which are connected to the process wastewater collection system of Building #5.

A third, 10,000-gallon, tank was located on a rack above the cooling water tank and was used for storage of city water. This tank was removed from the Subject Site in 1983.

Since these tanks were located in a paved area, and there is no evidence that a discharge has occurred, there is no reason to suspect that this water system impacted the environment.

In its October 1, 1996 letter, NJDEP requested documentation of the integrity of the catch basins. This area is located adjacent to PAEC O2. The current catch basin for the area (PAEC F4) is in the same location as the former dry well (PAEC O2). Extensive sampling of PAEC O2 has been

conducted, identifying localized contamination surrounding the former dry well.[17] No evidence of an adverse effect on the environment resulting from the catch basin or non-contact cooling water system has been found. No further investigation of this PAEC is proposed

5.8 PAEC D: No. 2 Fuel Oil System

5.8.1 Area Description

A 1,000-gallon aboveground No. 2 fuel oil tank was located in the exterior maintenance and storage area to the west of the leased warehouse space. According to facility personnel, this tank was owned by the landlord, Mr. Robert Fortunato, but was used periodically by Napp to fuel a rented compressor unit and heat the leased warehouse space. A concrete block containment basin filled with sand was provided for this tank.

A leased compressor unit was routinely located in a maintenance area adjacent to the fuel oil tank, on a concrete surface. This compressor is not believed to have generated any contaminated condensate discharges. Condensate from this system discharged to PVSC. Based on visual observation, the integrity of the floor beneath the compressor unit is good. There is no reason to believe a potential contaminant discharge, if any, has occurred in this area. As a result, no sampling or further investigations of the compressor unit was conducted or are proposed.

5.8.2 Phase II Sampling Program

The fuel oil tank was removed from its containment basin in February 1996. At that time, the tank was inspected and found to be free of any visible signs of corrosion or leaks. Similarly, the interior of the containment basin was inspected and showed no signs of cracking.

In order to further verify the integrity of the tank, sampling was conducted in accordance with N.J.A.C. 7:26E-3.9(a)1. On February 27, 1996 a sample of the surrounding sand (D-1) was collected and analyzed for TPHC. As indicated in Table 5-4[18], the TPHC concentration was below the NJDEP IGSCC total organic cap, therefore no further investigation was conducted.

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[17] The contamination found surrounding the former dry well (PAEC 02) is further discussed in Section 5.17.2.

[18] Table 5-4 shows results of sample D-1 in comparison to the RCRA regulatory limit. Sample D-1 was collected as a waste classification sample.

5.8.3 Conclusions and Recommendations

Based upon the investigation conducted, there is no evidence that a spill from this tank has impacted human health or the environment. Moreover, if a spill had occurred, the sand within the containment area, which has subsequently been removed, would have absorbed any release from tank operations. Furthermore, the integrity of the concrete below the tank is in good condition. The condition of the concrete below the tank will be confirmed during a proposed joint inspection with the NJDEP. No further action is proposed for this PAEC pending the results of this inspection.

5.9 PAEC E, F, and G: Wastewater Collection System, Historic Trench System, Pump Stations, and Floor Drains

5.9.1 Area Description

5.9.1.1 Wastewater Collection System, Pump Stations, Sumps and Historic Trench System

In general, wastewater from Napp's P&B operations area flowed through PAEC G1 to Pump Station #1 (PAEC F1) where it was pumped through overhead piping to the wastewater treatment system. These units were identified as individual PAECs in the February 1996 PAR and RIW. Subsequent to preparation of these documents a historic trench system (described below) was discovered. Since PAEC F (pump stations) and PAEC G (sumps) were determined to be part of PAEC E (wastewater collection system), these three PAECs and the historic trench system were considered as a single PAEC known as PAEC E, F, G during the remedial investigation. This combined PAEC was investigated as a single unit. Refer to Drawing P-1 in the February 1996 PAR for a process drain schematic of the Napp wastewater collection and treatment system which were upgraded between 1981 and 1990.

The process vessels which operated in the P&B and manufacturing areas of the Subject Site were flow-through process containers. Spills or leaks, if any, from these process vessels, or spills and leaks, if any, that occurred during the transfer of materials, entered the floor drains located within the process areas. The floors of the process areas were graded so that spilled materials would enter these drains. These drains were the entry points to the wastewater collection system. In general, hazardous materials were not stored by Napp in the process areas, aside from working quantities necessary for Napp's operations. These working quantities were contained in individual drums. Materials were transferred to these areas as needed from the aboveground bulk storage tanks (PAEC A) or from the drum storage area (PAEC M).

Wastewater collected throughout the Subject Site flowed through underground piping to a series of six below ground pump stations located throughout the Subject Site. These pump stations are identified as PAECs F1 through F6 on Figure 4-3, and are referred to as Pump Stations #1 through #6, respectively. The pump stations discharged to a catch basin and weir and then to the wastewater treatment system.

Pump Stations #1 (F1) is a 450-gallon fiberglass reinforced plastic ("FRP") lined concrete vault. Pump Station #2 (F2) is a 400-gallon FRP lined concrete vault. Pump Station #3 (F3) is a 25-gallon clay pipe sump. Pump Station #4 (F4) is an approximately 100-gallon concrete catch basin which was formerly a dry well (PAEC O2). Pump Station #5 (F5) is an approximately 140-gallon concrete pit. Pump Station #6 (F6) is of a 115-gallon concrete vault. The pump stations were FRP lined between 1981 and 1990 as part of the wastewater collection system upgrade. The pre-1981 wastewater collection system was updated between 1981-1990. According to Napp personnel, the process wastewater collection system was replaced in order to upgrade the system to current standards (e.g., steel pipe in concrete-filled trenches) and to better control the wastewater flow. The updating of the wastewater collection system included the installation of new piping within existing (brick- or concrete-lined) trenches which dated back to the time of the Subject Site's ownership by UPDW and the installation of new piping to accommodate Napp's operations in areas where trenches did not previously exist. The UPDW vintage trench system will be referred to as the historic trench system. The new wastewater piping primarily consisted of stainless steel or fiberglass piping encased in concrete.

In 1987, during wastewater pipeline modifications in the P&B area, soil excavated from beneath the floor slab was sampled for waste classification purposes. Initially, results from two composite samples indicated the presence of PCBs in the soil. Two additional samples were collected adjacent to the initial samples to confirm the presence of PCBs. The results of the second set of samples indicated PCB concentrations considerably lower than what was detected in the two initial soil samples. It was determined, at that time, that the initial soil samples represented a small, localized area of contamination. Analytical data, reports and correspondence related to this contamination are provided as Attachment 1 of Appendix B. The contaminated soils were removed and properly disposed of off-site.

Napp has no knowledge of any use of PCBs at the facility, and the source of the PCBs is unknown. On September 25, 1990, NUS Corporation submitted a letter report to USEPA indicating that no further action was recommended related to these PCB-contaminated soils. A copy of this letter is provided as Attachment 2 of Appendix B. The NUS letter references transformers located 15 to 20 feet from the area, which corresponds to the transformers located in PAEC Q1 as shown on Figure 4-3.

During Phase II of the remedial investigation, the historic trench system was determined to be much larger than previously known to Napp. Prior to conducting the remedial investigation, Napp personnel were not aware of the full extent of the historic trench system. Most of the historic trench system was not used by Napp and was beneath the floors of the P&B and manufacturing areas and beneath the existing wastewater collection system. No site plans are available to show the location of the historic trench system, which is believed to have been installed by UPDW. Napp personnel are not aware of any discharges from either the wastewater collection system or the historic trench system. Figure 5-6 illustrates ENSR's understanding, based on the remedial investigation, of the layout of the historic trench system.

5.9.1.2 Floor Drains in Sawwood Warehouse

There are four concrete floor drains located within the warehouse space leased from Fortunato by Napp (known as the Sawwood Warehouse). These floor drains were identified in the PAR and RIW as PAEC G2 (sumps). Based on observations made during Phase II, it was discovered that PAEC G2 is actually four floor drains. These floor drains are connected to the historic trench system which apparently extends to the south beyond the Subject Site and the Sawwood Warehouse.

The Sawwood Warehouse was used for storage of finished goods; no manufacturing operations were conducted there and only non-flammable materials were permitted to be stored there. Since most materials stored in this area were non-hazardous, any materials entering these floor drains as floor washings would not be expected to contain significant concentrations of contaminants. There were no reported spills in this area.

5.9.2 Phase II Sampling Program

In accordance with the February 1996 RIW, ENSR performed extensive sampling in PAEC E, F, G in order to evaluate the wastewater collection system and investigate the potential for a release from the wastewater collection system, as described below.

5.9.2.1 Historic Trench Investigation

ENSR began Phase II investigative activities at the trench known as the Main Trench (see Figure 5-6) connecting pump station F1 and trench access point G1. In the Napp installed wastewater collection system, wastewater flowed between G1 and F1 in the Main Trench. The portion of the Main Trench to the north of PAEC G1 contained piping associated with the most recent wastewater collection system. This piping was removed when the Main Trench was cleaned out. The Main Trench was cleaned out and visually inspected. The inspection of the Main Trench

revealed that the Main Trench was part of the vast historic trench system. Evidence of additional trenches oriented east to west were observed during the inspection. The inspection of the Main Trench also revealed that the Main Trench appeared to continue to the north based on the location of a brick barrier that appeared to be built into the Main Trench at the northern wall of the P&B building. The integrity of the wastewater collection system piping located in the Main Trench was found to be good. However, the Main Trench portion of the historic trench system exhibited significant integrity breaches which have been addressed through samples collected in PAEC G1.

The area between the Main Trench portion of the historic trench system and the wastewater collection system piping was observed to be partially filled with residual waste material. On April 24, 1996, one sample of this material (FG-DR-1) was collected from this area and analyzed for waste classification and Full Scan parameters. The residual sampling results are included in Appendix H. VOCs, PAHs, phenol, TPHC, and PCBs were detected in the sample at concentrations above the NJDEP soil cleanup criteria. Therefore, as proposed in the RIW, further investigation was conducted.

Integrity breaches were noted in the Main Trench portion of the historic trench system. Due to these integrity breaches as well as the analytical results of the residual material sample, ENSR advanced one boring (G1) adjacent to the Main Trench at the approximate location shown on Figure 4-1 on April 22, 1996. Two soil samples were collected at sample location G1 at depths of 3.0-3.5 feet bgs (G1-1) and 5.5-6 feet bgs (G1-2) below the concrete floor. Two samples were collected from this boring location due to the difference in the soils observed at the sample depths. Both samples were analyzed for the Full Scan. As indicated in Table 5-6, chlorobenzene was detected in both samples at concentrations above the NJDEP IGSCC. No other compounds were detected in either sample interval at concentrations above the NJDEP IGSCC.

During the cleanout and inspection of the Main Trench, several trenches were noted which appeared to extend east and west of the Main Trench. Additional investigation activities lead to the discovery of an extensive historic trench system beneath the southern portion of the facility (referred to as the P&B Area). ENSR conducted an extensive investigation of the historic trench system at the Subject Site between June and August 1996. No site plans are available to show the location of the historic trench system, which is believed to have been installed by UPDW.

In order to find the locations of other portions of the historic trenches, ENSR cored through the floors throughout the site buildings (P&B and manufacturing areas). As shown on Figure 5-7, a total of over 600 corings were advanced. Coring locations were selected based upon several factors, including known and expected historic trench locations (based on the investigation which began at the Main Trench), the location of the existing wastewater collection system, saw cuts

observed in the floor (indicating areas of new concrete), and random locations (where no evidence of trenches was apparent). Samples collected from over 200 of the 600 total coring locations were selected for laboratory analysis. All samples collected were analyzed for PCB's, and 45 samples were selected for analysis via the Full Scan. The samples that were collected included residual material from within the trenches, soil adjacent to the trenches, and soil from beneath the trenches.

Two layers of historic trenches were found to exist at the Subject Site and are identified as the lower and elevated trench systems on Figure 5-6. This trench system was found to be filled with debris, residual material, and soil. As part of the remedial activities performed to date, the majority of the historic trenches at the Subject Site were cleaned out and all residual material was removed from the historic trenches and properly disposed of off-site. Several integrity breaches, which were observed in the historic trench system, are discussed further in Section 5.9.4.

Portions of the historic trench system which are located beneath the existing wastewater collection system have not been cleaned out due to their inaccessibility. The integrity of the portions of the historic trench system which are accessible and which can be visually observed will be evaluated during a joint inspection to be conducted with the NJDEP. Additional samples are proposed to address the areas of the historic trench system which cannot be evaluated, as discussed in Section 5.9.4.

Data and sample locations for residual trench material are presented in Appendix H. PCBs detected in the residual materials sampled from within the historic trenches in the P&B area ranged from non-detected to over 3000 ppm. Since this residual material has been removed, this data is not representative of existing conditions and is presented for information purposes only.

Soil samples also were collected adjacent or below the trenches. These results are presented on Tables 5-5 through 5-21. Additionally, sample locations and analytical results for soil samples with constituent concentrations above NJDEP IGSCC are identified on Figure 5-8. The analytical results for the soil samples collected adjacent to and below the historic trenches in the P&B area indicated that significantly lower levels of PCBs were present in the soil than in the residual material. PCBs were detected in the soil samples at concentrations ranging from non-detected to under the NJDEP IGSCC of 50 ppm in most cases. VOCs, phenol and TPHC were also detected at concentrations above the NJDEP IGSCC in soil samples collected from the P&B area. Most of the soil samples collected in the remainder of the building area (north of the P&B area) indicated concentrations of any constituents at concentrations below the NJDEP IGSCC. One soil sample in the northern area (E-1) indicated the presence of chlorobenzene at a concentration above NJDEP IGSCC. Additionally, sample B328-A indicated phenol as a tentatively

identified compound at a concentration above NJDEP IGSCC.

During Phase II, investigative activities continued in the northern portion of the Subject Site at the location of the trenches which are part of the most recent wastewater collection system. One boring was advanced adjacent to an underground wastewater pipe located to the west of Building 1C (Sample E-1), at the approximate location shown on Figure 4-1. (Refer to Table 4-1 for the grid location number for this sample.) On April 22, 1996, one soil sample (E-1) was collected at a depth of 0.5-1.0 feet bgs. The sample was analyzed for the Full Scan. As indicated in Table 5-6, the only compound detected in sample E-1 above the NJDEP IGSCC was chlorobenzene.

Additional delineation for PCBs, PAHs, and VOCs was conducted during Phase III in areas where these compounds exceeded NJDEP RDCSCC, NRDCSCC and IGSCC.

In its October 1, 1996 letter, the NJDEP requested documentation of all drains, traps, and cleanouts. This has been accomplished to the extent possible through the trench investigation, and Phase III sampling program discussed in Section 5.9.3.

5.9.2.2 Pump Stations

Each pump station (PAEC F1-F6) was cleaned out and the interior of each pit was inspected. Based upon ENSR's inspection, PAECs F1, F5, and F6 were found to have good integrity and show no evidence of discharges to the environment. As a result, sampling was not proposed or conducted.

In its October 1, 1996 letter, the NJDEP indicated that PAEC F1 lacked integrity. However, the integrity concern in this area is actually related to the historic trench that is connected to this pump station, the Main Trench. Samples G1-1 and G1-2 were collected adjacent to the Main Trench. Additional sampling is proposed to delineate the area surrounding sample location G1. No further actions are proposed relative to pump stations F1, F5 and F6. The integrity of pump stations F1, F5 and F6 will be confirmed during the proposed joint inspection with the NJDEP.

Based on visual inspection, the FRP liner in pump station #2 (PAEC F2) appears to be bowed inward, (i.e. separated from the wall of the concrete pit). The FRP liner in pump station #3 (PAEC F3) was observed to be cracked, creating a potential pathway for a discharge from the pit. On January 14, 1997, two samples (F2A and F3A) were collected from PAECs F2 and F3, respectively. Tables 5-7 and 5-8 summarize the results of the soil sampling for PAECs F2 and F3A. As indicated in Table 5-7, 1,2-dichlorobenzene, tetrachloroethene, chlorobenzene, and 1,2-dichloroethane were detected in sample F2A at concentrations above the NJDEP IGSCC.

Additional samples are proposed for PAEC F2 in the Phase IV Sampling Program discussed in Section 5.9.3-2. As indicated in Table 5-8, no compounds were detected above the NJDEP IGSCC in sample F3A. Further investigations are not proposed for PAEC F3.

Upon further investigation, ENSR has determined that PAEC F4 is in the same location as the former dry well, PAEC O2. According to Napp personnel, the dry well was converted to a sump, now referred to as pump station #4 (PAEC F4). This area is addressed in Section 5.17.2 under PAEC O2. Additionally, PAEC I2 contains PAEC F5; therefore, if PAEC F5 had historically impacted the environment, that impact would have been identified through sampling conducted for PAEC I2. PAEC F6 is within PAEC M; therefore, if PAEC F6 had historically impacted the environment, that impact would have been identified through sampling conducted for PAEC M.

5.9.2.3 Sawwood Warehouse Floor Drains

On June 21 and July 11, 1996 ENSR collected samples from the material contained in each of the four floor drains located within the Sawwood Warehouse. Each sample was collected from residue present at the bottom of the floor drain, and was analyzed for PCBs. As indicated in Appendix H, PCB concentrations in the catch basins showed significant variation. With the exception of catch basin #2 (See Figure H-1 in Appendix H), each sample contained PCB concentrations above the NJDEP IGSCC. Based on visual observations, these catch basins do not appear to have been relined, and the integrity could not be determined. Preliminary investigation into this area has also indicated that there may be a trench system in the Sawwood Warehouse (similar to the historic trench system found on the Subject Site) which may lead to the adjacent property to the south.

The trench system in the Sawwood Warehouse is not located on the Subject Site and was reportedly not used by Napp. Moreover, pump station #1 on the Subject Site side of the boundary with the Sawwood Warehouse was operated by Napp to pump accumulated materials to Napp's wastewater treatment system. As shown on Figure 4-3, flow in the historic trenches is towards the Main Trench, then southward into pump station #1. Napp pumped material from pump station #1 to its wastewater treatment system. Napp believes that wastewater which flowed into the sump traveled southwesterly to the PVSC Hendricks Pump Station prior to the installation of a pump at this location. Napp has no knowledge that wastewater from this sump traveled south to the Sawwood Warehouse trench. Thus, it is believed that pump station #1 was the southern terminus of flow of wastewater from Napp's operations, and precluded Napp flow of wastewater from moving "offsite" to the Sawwood Warehouse.

The Sawwood Warehouse trench system appears to be similar to the historic trench system found on the Subject Site and is likely part of the former UPDW facility. This conclusion is

supported by the presence of PCBs in the residuals and the documentation of trench systems at other properties that were part of the former UPDW facility. As previously discussed, Napp has no record of the use of PCBs on the Subject Site. Accordingly, no further action to address the floor drains in the Sawwood Warehouse was performed or is proposed.

5.9.3 Phase III Sampling Program

5.9.3.1 Historic Trenches

In order to further investigate the constituents detected during Phase II, including the trench investigation results, additional sampling was conducted in areas where compounds exceeded NJDEP soil cleanup criteria. The Phase III investigation of the historic trench system and wastewater collection system was devised utilizing three basic sampling approaches. First, delineation of Phase II sample locations was conducted where constituents were detected above the NJDEP soil cleanup criteria. Second, soil sampling was conducted at locations where integrity breaches were observed in the historic trench system. These samples, identified as TREN-1 through TREN-7, were collected by coring through the base of the historic trench at the location of the integrity breach. Third, soil sampling was conducted adjacent to the historic trench system at locations where the residual sample collected from within the trench exhibited elevated PCB concentrations. These samples are identified as SOIL-1 through SOIL-8.

As indicated on Figure 5-8 and Tables 5-5 through 5-21, most of the Phase II sample locations located north of the P&B Area (north of the exposed historic trench system) in building 1C and 5 where constituents were detected above the NJDEP soil cleanup criteria in Phase II have been delineated to below the NJDEP IGSCC by sampling conducted during the Phase III investigation. Phenol at sample location B328-A and chlorobenzene at sample locations E-2A and E-1E are the only localized compounds for which delineation is not complete.

Phenol in sample B328-A, was detected as a tentatively identified compound at a concentration above the NJDEP IGSCC. Additional sampling is proposed to confirm the presence of phenol in sample location B328A, as discussed below.

During Phase III sampling surrounding Phase II sample location E-1, one boring (E-1A) was advanced adjacent to E-1. Two samples (E-1A and E-2A) were collected from this boring at depths of 3.5-4.0 feet bgs and 5.5-6.0 feet bgs, respectively. These depths correspond to the depth of the adjacent wastewater piping and 0-0.5 feet above the saturated zone. Additionally, samples were collected to the north (E-1B), south (E-1C), east (E-1D), and west (E-1E) of E-1, at 3.5-4.0 feet bgs, the depth of the wastewater piping. All of the soil samples were analyzed for chlorobenzene, benzo(a)anthracene, benzo(b)fluoranthene, and PCBs.

As indicated in Table 5-22, chlorobenzene was detected in soil samples E-2A and E-1E at concentrations above the NJDEP IGSCC. Soil samples E-1A, E-1B, E-1C, and E-1D did not indicate any compounds above the NJDEP soil cleanup criteria. Additional sampling is proposed as described below.

The second component of the investigation of the exposed historic trench system included sampling below the historic trench system at locations which exhibited integrity breaches, such as cracking. Seven samples (Tren-1 through Tren-7) were collected below the historic trench system. The locations of the soil samples are depicted on Figure 4-1. As indicated on Table 5-23 and Figure 5-8, PCBs were detected in all of the soil samples, but only one sample, TREN-2, indicated the presence of PCBs at a concentration above the NJDEP IGSCC. Additionally, chlorobenzene was detected in one sample, TREN-5, at a concentration above the NJDEP IGSCC. PAHs were not detected above the NJDEP IGSCC at any of the TREN sample locations. Further delineation of TREN-2 and TREN-5 is discussed below.

During this phase of the Phase III investigation of PAEC E, F, G, a pit was observed at the western end of the northernmost historic trench (i.e. northwestern corner of exposed historic trench system). Upon investigation, the pit did not appear to have a solid concrete base. ENSR also found that a pipe traversed the pit. Napp and ENSR personnel were unable to identify the origin or terminus of the pipe. Three samples identified on Figure 5-8 as PIT-A, PIT-B, and PIT-C, were collected from soil in this area. As indicated in Table 5-24, VOCs, phenol, and PCBs were detected in each sample at concentrations above the NJDEP IGSCC, and the total organic concentration cap was exceeded in each sample. Additional investigation of this pit is proposed as described below.

Finally, on August 13, 1996, ENSR collected seven samples (SOIL-1 through SOIL-7 and sample SOIL-8 (duplicate of SOIL-2)) from locations adjacent to historic trenches. These locations were adjacent to points where high concentrations of PCBs were detected in the residual material that had been removed from the historic trenches. These samples were collected even though the associated trench locations did not exhibit obvious integrity concerns. Sample locations are depicted on Figure 4-1 and results are summarized in Table 5-25 and 5-26. As indicated in Tables 5-25 and 5-26, no constituents were detected in soil samples SOIL-5, SOIL-6, and SOIL-7 at concentrations above the NJDEP IGSCC. Chlorobenzene was detected in soil samples SOIL-1 through SOIL-4 and duplicate sample SOIL-8 at concentrations above the NJDEP IGSCC, and tetrachloroethene was detected at concentrations above the NJDEP IGSCC in soil samples SOIL-2 and duplicate sample SOIL-8. Soil samples SOIL-2 and SOIL-3 each indicated the presence of either 1,2-dichlorobenzene or phenol above the NJDEP IGSCC. Additional investigation of samples SOIL-1 through SOIL-4 are proposed below.

5.9.3.2 Conclusions and Recommendations

Based upon the Phase III results, delineation of the wastewater collection system to the NJDEP IGSCC is not complete. Further delineation will be conducted surrounding various previous sample locations as described below. All proposed sampling locations are shown in Figure 5-10.

1. Sample Locations E-1, E-2A and E-1E

Phase II soil sample location E-1 was partially delineated horizontally during Phase III as previously discussed. Chlorobenzene was detected in samples E-1, E-2A and E-1E at a concentration above NJDEP IGSCC. A discussion of previous delineation of this area as well as the proposed additional delineation samples is presented below.

Vertical: Sample E-2A was collected at a depth of 5.5-6 feet bgs (approximate groundwater elevation) below sample location E-1. Chlorobenzene was detected in sample E-2A at a concentration above the NJDEP IGSCC. Since VOC delineation will not extend into the saturated zone, contamination within the saturated zone will be considered delineated vertically by the silt/clay layer and will be further investigated by the groundwater investigation.

Delineation will be conducted horizontally from sample location E-1 as described below. Samples also will be collected vertically at each of the horizontal locations and held for analysis, if necessary.

North: Chlorobenzene delineation in the surface interval to the north of sample location E-1 is considered complete to NJDEP IGSCC at sample location E1-C. Sample E-1C was collected at a depth of 0.67-1.17 feet bgs. The chlorobenzene result for sample E-1C is below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location E-1C (E-1C-4) to conduct additional delineation to the north of sample E-1. Two samples will be collected at 3-3.5 feet bgs and the interval 0-0.5 feet above the saturated zone.

East: Proposed sample location B328-D-4 is located to the east of sample location E-1 and will be used to further investigate the area surrounding sample location B328, as discussed below. Chlorobenzene will be added to the analysis of the depth samples to be collected at proposed sample location B328-D-4. Three samples will be collected at proposed sample location B328-D-4 at depths of 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone. The chlorobenzene results from samples collected at proposed sample location B328-D-4 will delineate samples E-1, E-2A and E-1E to the east.

South: Chlorobenzene delineation in the surface interval to the south of sample location E-1 is considered complete to NJDEP IGSCC at sample location E-1D. Sample E-1D was collected at a depth of 0.5-1.0 feet bgs. The chlorobenzene result for sample E-1D is below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location E-1D (E-1D-4) to conduct additional delineation to the south of sample E-1. Two samples will be collected at 3-3.5 feet bgs and 0-0.5 feet above the saturated zone.

West: Chlorobenzene delineation in the surface interval to the west of sample location E-1 is considered complete to NJDEP IGSCC at sample location E-1B. Sample E-1B was collected at a depth of 2.17-2.67 feet bgs, which was the first soil encountered at this location. The chlorobenzene result for sample E-1B is below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location E-1B (E-1B-4) to conduct additional delineation to the west of sample E-1. Two samples will be collected at 3-3.5 feet bgs and 0-0.5 feet above the saturated zone.

2. Sample Location B328-A

Phenol was detected as a tentatively identified compound at a concentration above the NJDEP IGSCC at a depth of 4-4.5 feet bgs at sample location B328-A. ENSR proposes to conduct further investigation in this area to delineate sample location B328-A. The delineation of sample location B328-A that has been completed to date is presented as part of the following discussion.

Vertical: Sample B328-A was collected at a depth of 4.0-4.5 feet bgs. Phenol was detected as a tentatively identified compound in sample B328-A at a concentration above the NJDEP IGSCC.

One boring (B328-A-4) will be advanced adjacent to sample location B328-A and one sample will be collected at a depth of 0-0.5 feet above the saturated zone to be analyzed for phenol. Samples will be collected at locations horizontal to sample location B328-A, but will be held at the laboratory pending results from sample B328-A-4. These delineation samples will be analyzed only if the phenol result for sample B328-A-4 exceeds NJDEP IGSCC.

The horizontal delineation samples will be collected to the north, east, southwest and northwest of B328-A. Samples will also be collected vertically at each horizontal location and held for analyses pending determination of whether the corresponding surface result exceeds NJDEP IGSCC.

North: Phenol delineation in the surface interval to the north of sample B328-A is considered complete to NJDEP IGSCC at sample location B328-B. Sample B328-B was collected at a depth of 1.1-1.6 feet bgs. The phenol result for sample B328-B was detected at a concentration below NJDEP IGSCC.

Additional samples will be collected adjacent to sample location B328-B (B328-B-4) to conduct additional delineation to the north of sample B328-A. Two samples will be collected at 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone to be analyzed for phenol, if necessary.

East: Phenol delineation in the intermediate interval to the east of sample B328-A is considered complete to NJDEP IGSCC at sample location 10-3. Sample 10-3 was collected at a depth of 4.5-5 feet bgs. The phenol result for sample 10-3 was detected at a concentration below NJDEP IGSCC.

Additional samples will be collected adjacent to sample location 10-3 (10-3-4) to conduct additional delineation to the east of sample location B328-A. Two samples will be collected at depths of 0.5-1.0 feet bgs and 3.0-3.5 feet bgs to be analyzed for phenol, if necessary.

South: No sampling has been conducted to the south of sample location B328-A.

Southwest: Sample B328-D was collected to the southwest of sample location B328-A. Therefore, one boring will be advanced at sample location B328-D-4 to delineate phenol to the south of sample location B328-A. Three samples will be collected at the 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone to be analyzed for phenol, if necessary.

Proposed sample B328-D-4 also will be used delineate samples E-1,. E-2A and E-1E to the east, as described below by adding chlorobenzene to the analysis.

Northwest: Phenol delineation in the surface interval to the northwest of sample B328-A is considered complete to NJDEP IGSCC at sample location B328-C. Sample B328-C was collected at a depth of 1.4-1.9 feet bgs. The phenol result for sample B328-C was detected at a concentration below NJDEP IGSCC.

Additional samples will be collected adjacent to sample location B328-C (B328-C-4) to conduct additional delineation to the northwest of sample location B328-A. Two samples will be collected at 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone to be analyzed for phenol, if necessary.

3. Sample Location F2A

Chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane and tetrachloroethene were detected at sample location F2A in the interval approximately 5.5-6.0 feet bgs at concentrations above NJDEP IGSCC and will be delineated for these compounds as described below. A discussion of the previous delineation of this area as well as the proposed additional delineation is presented below.

Vertical: One boring (F2A-4) will be advanced adjacent to sample location F2A to determine if contaminated soil exists at depths of 0.5-1.0 feet bgs and 3.0-3.5 feet bgs. The soil sample will be analyzed for chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane and tetrachloroethene.

Delineation will be conducted horizontally from sample location F2A to the northwest, east, southeast and west of sample F2A as described below. Samples will be collected vertically at the horizontal locations and held for analysis, if necessary.

Northwest: VOC delineation in the intermediate interval to the northwest of sample location F2A is considered complete to NJDEP IGSCC at sample location F3A. Sample F3A was collected at a depth of 2.5-3.0 feet bgs, which was the first soil encountered below the base of the pit at PAEC F3. The VOC results for sample F3A were at concentrations below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location F3A (F3A-4) to conduct additional delineation to the northwest of sample F2A. One sample will be collected in the interval of 0-0.5 feet above the saturated zone and analyzed for chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane and tetrachloroethene.

East: VOC delineation in the surface interval to the east of sample location F2A is considered complete to NJDEP IGSCC at sample location B193. Sample B193 was collected at a depth of approximately 1.0-1.5 feet bgs, which was the depth of the first soil encountered below the concrete floor. The VOC results for B193 were at concentrations below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location B193 (B193-4) to conduct additional delineation to the east of sample F2A. Two samples will be collected at depths of 3.0-3.5 feet bgs and in the interval of 0-0.5 feet above the saturated zone. The samples will be analyzed for chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane and tetrachloroethene.
Southeast: VOC delineation in the surface interval to the southeast of sample location F2A is considered complete to NJDEP IGSCC at sample location C43. Sample C43 was collected at a depth of approximately 1-1.5 feet bgs, which was the depth of the first soil encountered below the concrete floor. The VOC results for C43 were detected at concentrations below the NJDEP

IGSCC.

Additional samples will be collected adjacent to sample location C43 (C43-4) to conduct additional delineation to the southeast of sample F2A. Two samples will be collected at 3-3.5 feet bgs and 0-0.5 feet above the saturated zone. They will be analyzed for chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane and tetrachloroethene. Proposed sample C43-4 also will be used to delineate samples PIT A, B, C to the east, as discussed below.

West: No samples to the west of sample location F2A can used to delineate VOCs in sample F2A. Therefore, a boring will be advanced (F2A-D1) to the west of sample location F2A to conduct additional delineation in this direction. Three samples will be collected at depths of 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and in the interval of 0-0.5 feet above the saturated zone. The samples will be analyzed for chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane and tetrachloroethene. Proposed sample F2A-D1 will be also used to delineate samples PIT A, B, C to the northeast, as discussed below.

4. Sample locations Pit A, B and C and TREN-2

Cis-1,2-dichloroethene, trichloroethene, tetrachloroethene, 1,1,1-trichloroethane, chlorobenzene, phenol, 1,2-dichlorobenzene and PCBs were detected at concentrations above NJDEP IGSCC in samples PIT-A, B, and C at approximate depths of 2.5-3.5 feet bgs. PCBs were detected in sample TREN-2 at concentrations above NJDEP IGSCC. Samples PIT-A, B, C and TREN-2 are located in close proximity to each other, and will be delineated for cis-1,2-dichloroethene, trichloroethene, tetrachloroethene, 1,1,1-trichloroethane, chlorobenzene, phenol, 1,2-dichlorobenzene and PCBs as a unit. A discussion of previous sampling used to delineate this area as well as the additional proposed delineation samples is presented below.

Vertical: One boring (PIT-4C) will be advanced adjacent to sample locations PIT A, B and C and TREN-2 to vertically delineate samples PIT A, B and C and TREN-2. Four samples will be collected at 0.5-1.0 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer. The 3.0-3.5 feet bgs interval at sample locations PIT A, B and C and TREN-2 has previously been sampled, therefore this depth interval will not be sampled at the proposed sample location PIT-4C.

Since VOC and phenol delineation will not extend into the saturated zone, the above referenced VOCs and phenol will only be analyzed at depths 0.5-1.0 feet bgs and 0-0.5 feet above the saturated zone.

PCBs will be analyzed at all sample depths. As discussed in Section 5.4.1, samples to be analyzed for PCBs at depths within the saturated zone (8.0-8.5 feet bgs and the interval of 0-0.5 feet above the silt/clay layer) will be held at the laboratory for one week pending results from the sample collected at 0-0.5 feet above the saturated zone. Based on the results of this sample, a decision will be made regarding the analysis of the remaining two samples.

Delineation will be conducted horizontally from sample locations PIT A, B and C and TREN-2 to the northeast, east, south and west as described below. Samples will also be collected vertically at these horizontal locations and held for analysis, if necessary.

Northeast: No samples were collected to the northeast of sample locations PIT A, B and C and TREN-2 which can used to delineate VOCs, phenol or PCBs. Therefore, a boring (F2A-D1) will be advanced to the northeast of sample locations PIT A, B and C and TREN-2. Samples will be collected at depths of 0.5-1.0 feet bgs, 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer.

Since VOC and phenol delineation will not extend into the saturated zone, the above referenced VOCs and phenol will only be analyzed at depths 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

PCBs will be analyzed at the three upper depths. As discussed in Section 5.4.1, samples to be analyzed for PCBs at depths within the saturated zone (8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer) will be held at the laboratory for one week pending results from the sample collected at 0-0.5 feet above the saturated zone. Based on the PCB results of this sample, a decision will be made regarding the PCB analysis of the remaining two samples.

Proposed sample F2A-D1 also will be used to delineate sample location F2A to the west, as previously discussed.

East: VOC, phenol and PCB delineation in the surface interval (approximately 1-1.5 feet bgs) to the east of sample locations PIT A, B and C and TREN-2 is considered complete to NJDEP IGSCC at sample location C43. This corresponds to the depth of the first soil encountered below the floor of the pit. The VOC, phenol and PCB results for C43 were below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location C43 (C43-4) to conduct additional delineation to the east of sample locations PIT A, B and C and TREN-2. Four samples will be collected at depths of 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer.

Since VOC and phenol delineation will not extend into the saturated zone, these compounds will only be analyzed at depths 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

PCBs will be analyzed at the upper two sample depths. Samples at depths within the saturated zone (8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer) will be held at the laboratory for one week pending results from the sample collected at 0-0.5 feet above the saturated zone. Based on the PCB results of this sample, a decision will be made regarding the PCB analysis of the remaining two samples.

Proposed sample C43-4 is also used to delineate sample location F2A to the southeast, as previously discussed.

South: As discussed below, proposed sample location TREN-15 is at the location of an integrity breach of the historic trench system. Proposed sample TREN-15 is also located to the south of sample locations PIT A, B and C and TREN-2. The results of the TREN-15 analysis will be used to provide additional delineation to the south of sample locations PIT A, B and C and TREN-2 as well as to determine if contaminated soil exists below the integrity breach at sample location TREN-15. Five samples will be collected at depths of 0.5-1.0 feet bgs, 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer.

Since VOC and phenol delineation will not extend into the saturated zone, VOCs and phenol will only be analyzed at depths 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

PCBs will be analyzed at the three upper sample depths. As discussed in Section 5.4.1, samples to be analyzed for PCBs at depths within the saturated zone (8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer) will be held at the laboratory for one week pending PCB results from the sample collected at 0-0.5 feet above the saturated zone. Based on these results, a decision will be made regarding analysis of the remaining two samples.

West: PCB delineation in the surface interval to the west of sample locations PIT A, B and C and TREN-2 is considered complete to NJDEP IGSCC at sample locations Q1-2 and Q1-3 collected at depths of 0.5-1 feet bgs. The PCB results for both samples are below the NJDEP IGSCC.

Additional samples will be collected adjacent to samples Q1-2 and Q1-3 at location PIT-D2 to conduct additional delineation to the west of sample locations PIT A, B and C and TREN-2. Five samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer.

Since VOC and phenol delineation will not extend into the saturated zone, the above referenced VOCs and phenol will only be analyzed at depths 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

Since the surface interval has been delineated for PCBs at sample locations Q1-2 and Q1-3, PCBs will be analyzed at sample depths 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer. As discussed in Section 5.4.1, samples to be analyzed for PCBs at depths within the saturated zone (8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer) will be held at the laboratory for one week pending the PCB results from the sample collected at 0-0.5 feet above the saturated zone. Based on the results of this sample, a decision will be made regarding analysis of the remaining two samples.

5. Sample Locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2

Chlorobenzene was detected at concentrations above the NJDEP IGSCC in samples SOIL-4, TREN-5, G1-1 and G1-2. Chlorobenzene and phenol were detected at concentrations above NJDEP IGSCC in sample SOIL-3. Samples SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 are located in close proximity to each other and will be delineated as a unit for phenol and chlorobenzene. A discussion of previous samples collected to delineate this area as well as the proposed additional delineation samples is presented below.

Vertical: The intermediate depth intervals at sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 have been analyzed for chlorobenzene and phenol. Since VOC and phenol delineation will not extend into the saturated zone, vertical delineation will not be conducted at this location. Contamination within the saturated zone will be considered delineated vertically by the silt/clay layer and further addressed by the groundwater investigation.

Delineation will be conducted horizontally from sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 to the east, southeast and west as described below. Samples will also be collected vertically at these locations.

North: Phenol and chlorobenzene delineation in the intermediate interval to the north of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 is considered complete to NJDEP IGSCC. Samples TREN-4 and duplicate sample TREN-10 were collected at a depth of 3.08-3.67 feet bgs, and phenol and chlorobenzene results for these samples were below NJDEP IGSCC. Thus, no additional sampling is proposed to delineate sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 to the north.

East: Chlorobenzene and phenol delineation in the intermediate interval to the east of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 is considered complete to NJDEP IGSCC at sample location TREN-6 collected at a depth of 3.75-4.08 feet bgs. The chlorobenzene and phenol results for sample TREN-6 were below the NJDEP IGSCC.

As discussed below, proposed sample location TREN-14 is located at a location of an integrity breach of the historic trench system. Proposed sample location TREN-14 is also located to the east of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 and adjacent to TREN-6. The results of the samples collected at proposed sample location TREN-14 will be used to conduct additional delineation to the east of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 and adjacent to TREN-6 as well as to determine if contaminated soil exists below the integrity breach at sample location TREN-14. Since VOC and phenol delineation will not extend into the saturated zone, chlorobenzene and phenol will only be analyzed at depths 0.5-1.0 feet bgs, 3-3.5 feet bgs and 0-0.5 feet above the saturated zone.

Southeast: No samples were collected to the southeast of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 which can used to delineate chlorobenzene or phenol at these locations. Therefore, a boring (SOIL-D1) will be advanced to the southeast of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 to conduct additional delineation. Since VOC and phenol delineation will not extend into the saturated zone, chlorobenzene and phenol will only be analyzed at depths 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

West: Chlorobenzene and phenol delineation in the intermediate interval to the west of sample locations SOIL-3, SOIL-4, TREN-5, G1-1 and G1-2 is considered complete to NJDEP IGSCC at sample location SOIL-5 collected at a depth of 2.5-3.0 feet bgs. The chlorobenzene and phenol results for sample SOIL-5 were placed below the NJDEP IGSCC.

An additional boring (SOIL-D2) will be advanced adjacent to sample location SOIL-5. Since the intermediate interval (2.5-3.0 feet bgs) has been delineated for chlorobenzene and phenol at sample location SOIL-5, two samples will be collected at depths 0.5-1.0 feet bgs and 0-0.5 feet above the saturated zone and analyzed for chlorobenzene and phenol

6. Sample Location SOIL-2/8

Since VOC and phenol delineation will not extend into the saturated zone, chlorobenzene and phenol will only be analyzed at depths 0.5-1.0 feet bgs and 0-0.5 feet above the saturated zone. Since SOIL-5 was collected at 2.5-3.0 feet bgs and the chlorobenzene and phenol results of this sample are below the NJDEP IGSCC, the interval of 3.0-3.5 feet bgs will not be sampled.

Chlorobenzene, 1,2-dichlorobenzene and tetrachloroethene were detected at a depth of 2-2.5 feet bgs in sample locations SOIL-2 and duplicate sample SOIL-8 at concentrations above the NJDEP IGSCC. Sample SOIL-2/8 will be delineated for chlorobenzene, 1,2-dichlorobenzene and tetrachloroethene. A discussion of samples previously collected to delineate this area as well as the proposed additional delineation samples are presented below.

Vertical: One boring (SOIL2-4) will be advanced adjacent to sample location SOIL-2/8 to vertically delineate this location. Two samples will be collected at 0.5-1.0 feet bgs and 0-0.5 feet above the saturated zone and analyzed for chlorobenzene, tetrachloroethene, and 1,2-dichlorobenzene. The intermediate interval at sample location SOIL-2/8 has previously been sampled, therefore the depth interval of 3.0-3.5 feet bgs will not be sampled at the proposed sample location SOIL2-4.

Proposed sample SOIL2-4 is also used to delineate sample SOIL-1 to the west, as further discussed below.

Delineation will be conducted horizontally from sample location SOIL-2/8 to the north and northeast of sample location SOIL-2/8 as described below. Samples will also be collected vertically at these locations.

North: VOC delineation in the surface interval to the north of sample location SOIL-2/8 is considered complete to NJDEP IGSCC at sample location C72 collected at approximately 1.0-1.5 feet bgs, which is the depth of the first soil encountered below the floor. The VOC results for sample C72 were below the NJDEP IGSCC.

An additional boring (C72-4) will be advanced adjacent to sample location C72 to conduct additional delineation to the north of sample SOIL-2/8. Two samples will be collected at depths of 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone and analyzed for chlorobenzene, 1,2-dichlorobenzene and tetrachloroethene.

Northeast: VOC delineation in the surface interval to the northeast of sample SOIL-2/8 is considered complete to NJDEP IGSCC at sample location C77 collected at a depth of approximately 1-1.5 feet bgs, which is the depth of the first soil encountered below the floor. The VOC results for sample C77 were below the NJDEP IGSCC.

An additional boring (C77-4) will be advanced adjacent to sample location C77 to conduct additional delineation of chlorobenzene, 1,2-dichlorobenzene and tetrachloroethene at depths 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone. Proposed sample location C77-4 also will be used to delineate SOIL-1 to the north, as further discussed below.

South: VOC delineation of sample SOIL-2/8 is considered complete to NJDEP IGSCC at sample location TREN-6 collected at a depth of 3.75-4.08 feet bgs. The VOC results for sample TREN-6 were below the NJDEP IGSCC.

No additional samples are proposed to the south of sample location SOIL-2/8.

West: VOC delineation to the west of sample SOIL-2/8 is considered complete to NJDEP IGSCC at sample location TREN-4/10 at a depth of 3.08-3.67 feet bgs. The VOC results for samples TREN-4 and TREN-10 were below the NJDEP IGSCC.

No additional samples are proposed to the west of sample location SOIL-2/8.

7. Soil -1.

Chlorobenzene was detected in sample SOIL-1 at a depth of 2.5-3.0 feet bgs at a concentration above NJDEP IGSCC. A discussion of samples previously collected to delineate this area as well as the additional proposed delineation samples are presented below.

Vertical: One boring (SOIL1-4) will be advanced adjacent to sample location SOIL-1 to vertically delineate sample SOIL-1 at this location. Since VOC delineation will not extend into the saturated zone, chlorobenzene will be analyzed at 0-0.5 feet above the saturated zone.

Delineation will be conducted horizontally from sample location SOIL-1 to the north, east and west as described below. Samples will also be collected vertically at these horizontal locations.

North: Chlorobenzene delineation in the surface interval to the north of sample location SOIL-1 is considered complete to NJDEP IGSCC at sample location C77 collected at a depth of approximately 1-1.5 feet bgs (the depth of the first soil encountered below the floor). The VOC results for sample C77 were detected at concentrations below the NJDEP IGSCC.

One boring (C77-4) will be advanced adjacent to sample location C77 to conduct additional delineation to the north of sample SOIL-1. Since VOC and phenol delineation will not extend into the saturated zone, chlorobenzene will be analyzed at depths 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

Proposed sample location C77-4 also will be used to delineate SOIL-2/8 to the northeast, as previously discussed.

East: As discussed below, proposed sample location TREN-12 is located at a location of an integrity breach of the historic trench system. Proposed sample location TREN-12 is also located to the east of sample location SOIL-1 and TREN-2. The results of the proposed samples collected at the TREN-12 location will be used to conduct additional delineation to the east of sample location SOIL-1.

Since VOC and phenol delineation will not extend into the saturated zone, chlorobenzene will be analyzed at depths 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

South: Chlorobenzene delineation to the south of sample SOIL-1 is considered complete to NJDEP IGSCC at sample location TREN-6 collected at a depth of 3.75-4.08 feet bgs. The chlorobenzene result for sample TREN-6 was below the NJDEP IGSCC.

No additional samples are proposed to the south of sample location SOIL-1 for delineation.

West: A boring (SOIL2-4) will be advanced to the west of sample location SOIL-1 to conduct additional delineation. One sample will be collected at a depth of 0-0.5 feet above the saturated zone. Since VOC and phenol delineation will not extend into the saturated zone, Samples will not be collected within the saturated zone.

Proposed sample location SOIL2-4 also will be used to vertically delineate SOIL-2/8, as previously discussed.

8. PAEC V3.

Chlorobenzene was detected at a concentration above NJDEP IGSCC in sample V3-1 at a depth of 2-2.5 feet bgs. ENSR proposes to conduct additional delineation sampling at PAEC V3. A discussion of samples previously collected to delineate this area as well as the additional proposed delineation samples are described below.

Vertical: One boring (V3-1-4) will be advanced adjacent to sample location V3-1 for vertical delineation. Sample V3-1 was collected at a depth of 2.0-2.5 feet bgs, the depth of the first soil encountered below the surface concrete, therefore the surface interval and intermediate interval of 3.0-3.5 feet bgs will not be sampled. Since VOC delineation will not extend into the saturated zone, the area within the saturated zone will not be sampled. Chlorobenzene will be analyzed at 0-0.5 feet above the saturated zone.

Delineation will be conducted horizontally from sample location V3-1-4 to the north, south and west of sample location V3-1 as described below. Samples will also be collected vertically at these horizontal locations.

North: As discussed below, proposed sample TREN-15 is located at a location of an integrity breach of the historic trench system. Proposed sample location TREN-15 is also located to the north of sample location V3-1. Accordingly, the results of the proposed samples collected at this location will be used to delineate sample location V3-1 to the north, as well as to determine if contaminated soil exists below the integrity breach at sample location TREN-15. Five samples will be collected at proposed sample location TREN-15 to evaluate the soil underneath the integrity breach at this location. Since VOC delineation will not extend into the saturated zone, only the results from chlorobenzene analysis at depths 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone will be used to delineate sample V3-1 to the north.

East: Chlorobenzene delineation to the east of sample location V3-1 is considered complete to NJDEP IGSCC at sample locations TREN-3 and SOIL-5 collected at depths of 2.92-3.42 feet bgs and 2.5-3 feet bgs, respectively. The chlorobenzene results for these samples were below NJDEP IGSCC. No additional samples are proposed to delineate sample location V3-1 to the east.

South: A boring (V3-1-D2) will be advanced to the south of sample location V3-1 to conduct additional delineation of chlorobenzene. Since VOC delineation will not extend into the saturated zone, samples will not be collected within the saturated zone. Three samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

West: A boring (V3-1-D1) will be advanced to the west of sample location V3-1 to conduct additional delineation of chlorobenzene. Since VOC delineation will not extend into the saturated zone, samples will not be collected within the saturated zone. Three samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and 0-0.5 feet above the saturated zone.

9. Completion of Trench Investigation.

In its October 1, 1996 letter, NJDEP requested sampling along the trench lines at 50-foot intervals. ENSR and Napp believe that the extensive coring program beneath the floors of the facility, including several soil samples that were collected in the trench area and were analyzed for the Full Scan, in addition to the sampling proposed herein, satisfy this requirement. In a January 6, 1997 meeting with NJDEP, it was agreed that in lieu of collecting samples at 50-foot intervals, trench integrity could be evaluated and samples collected at locations of poor trench integrity. To date, a total of 15 soil samples have been collected in the P&B area (Tren-1 through

Tren-7, SOIL-1 through SOIL-7, and PIT-A,B,C), either below or directly adjacent to trenches specifically to evaluate poor trench integrity.

Approximately 450 feet of trenches remains (See Figure 5-10) where trench integrity cannot be visually evaluated because the existing wastewater collection system overlays the historic trench. However, as previously discussed, all accessible residual material from the P&B trenches has been removed from the Subject Site and properly disposed of off-site. A substantial visual evaluation of trench integrity has been completed and locations of poor integrity in the trenches have been identified. The extensive work already completed to address the historic trench system provides a total of seven soil sample locations which can be used to evaluate the area where the existing wastewater collection system overlays the historic trench system. The seven sample locations are B193, B6A/B, SOIL-2/8, OF-1, B55A/B, OF-4 and OF-3. All of these samples are located adjacent to an area where the existing wastewater collections system overlays the historic trench system. Three of these sample locations have been analyzed for Full Scan and four sample locations have been analyzed for PCBs. All of the analytical results were below NJDEP IGSCC.

ENSR and Napp propose five additional sample locations (TREN-11, TREN-12, TREN-13, TREN-14 and TREN-15) to complete VOCs and phenol delineation and the evaluation of the trench integrity in areas where the existing wastewater collection system overlays the historic trench system. No other sampling is proposed to specifically evaluate trench integrity. Sample locations are approximate, actual locations will be determined in the field, and will be biased towards locations of poor trench integrity. Proposed sample locations TREN-11 to TREN-15 are described below.

Proposed Sample Location TREN-11

An integrity breach is located at proposed sample location TREN-11, shown on Figure 5-10. Sample B55A/B located adjacent to proposed sample location TREN-11 was analyzed for PCBs during the Phase II sampling program. PCBs were detected at a concentration below the NJDEP IGSCC; therefore sample B55A/B will be used to demonstrate that the integrity breach at proposed sample location TREN-11 has not impacted soils in this area with PCBs.

One boring will be advanced at proposed sample location TREN-11 to evaluate whether phenol or VOCs in the residual material in this area has impacted the environment. Samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and the interval 0-0.5 feet above the saturated zone and will be analyzed for phenol and VOC+10.

Proposed Sample Location TREN-12

Several integrity breaches are located in the area of TREN-12, shown on Figure 5-10. Soil sample OF-4, located adjacent to TREN-12, was analyzed for PCBs during the Phase II sampling program. PCB concentrations in this sample were below the NJDEP IGSCC, therefore sample OF-4 will be used to demonstrate that the integrity breach at proposed sample location TREN-12 has not impacted soils in this area with PCBs.

One boring will be advanced at proposed sample location TREN-12 to evaluate whether phenol or VOCs in the residual material in this area has impacted the environment. Samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and the interval 0-0.5 feet above the saturated zone and will be analyzed for phenol and VOC+10.

Proposed Sample Location TREN-13

An integrity breach is located at proposed sample location TREN-13 shown on Figure 5-10. Sample B25 located adjacent to proposed sample location TREN-13 was analyzed for PCBs during the Phase II sampling program. PCB concentrations were below the NJDEP IGSCC; therefore sample B25 will be used to demonstrate that the integrity breach at proposed sample location TREN-13 has not impacted soils in this area with PCBs.

One boring will be advanced at proposed sample location TREN-13 to evaluate whether phenol or VOCs in the residual material in this area has impacted the environment. Samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and the interval 0-0.5 feet above the saturated zone and will be analyzed for phenol and VOC+10.

Proposed Sample Location TREN-14

An integrity breach is located at proposed sample location TREN-14, shown on Figure 5-10. Sample B29 located adjacent to proposed sample location TREN-14 was analyzed for PCBs during the Phase II sampling program. PCBs were detected at a concentration below the NJDEP IGSCC; therefore sample B29 will be used to demonstrate that the integrity breach at proposed sample location TREN-14 has not impacted soils in this area with PCBs.

One boring will be advanced at proposed sample location TREN-14 to evaluate whether VOCs or phenol in the residual material in this area has impacted the environment. Samples will be collected at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and the interval 0-0.5 feet above the saturated zone and will be analyzed for phenol and VOC+10.

Proposed Sample Location TREN-15

An integrity breach is located at proposed sample location TREN-15, shown on Figure 5-10. No previous samples have been collected in the area of proposed sample location TREN-15 to evaluate if the integrity breach in this area has impacted the environment. Therefore, one boring will be advanced at proposed sample location TREN-15. PCB, phenol and VOC analysis will be conducted at 0.5-1.0 feet bgs, 3.0-3.5 feet bgs and the interval 0-0.5 feet above the saturated zone and will be analyzed for PCBs, phenol and VOC+10.
Locations of poor integrity also have been identified at locations TREN-3 and TREN-4. Samples have been collected in these areas at depths of 2.92-3.42 feet bgs and 3.08-3.67 feet bgs, respectively and analyzed for Full Scan. Both samples indicated results of PCBs, VOCs and phenol at concentrations below NJDEP IGSCC. No further action is proposed at these locations of poor integrity.

In its October 1, 1996 letter, NJDEP requested that Napp document all historical usage of PCBs at the facility. Napp has no knowledge of any PCB usage at the Subject Site. Additionally, a sample of transformer fluid from PAEC Q1 did not indicate the presence of PCBs. The source of the PCB contamination at the Subject Site is unknown, and is believed to pre-date Napp's usage of the Subject Site.

5.10 PAEC H: Hexamethylene Diamine Loading Area

5.10.1 Area Description

Hexamethylene diamine was periodically loaded from tank trucks to holding vessels located in Building #5. The paved loading area is located to the west of Building #5.

A concrete catch basin with a weir is located adjacent to the loading point. This system directed process wastewater collected from the manufacturing building to the 500-gallon holding pit, PAEC I1. Any spills or leaks from hose connections at the loading point entered the catch basin and were ultimately discharged to the facility wastewater treatment system. Solid material settled along the base and sides of this basin. According to Napp personnel, this basin was either installed or lined during the 1981-1990 period.

Since the loading area is paved and discharges to the catch basin, there is no reason to suspect that a discharge from the catch basin has occurred, or if one did, that it would have impacted the environment. However, in accordance with N.J.A.C. 7:26E-3.9(e)3.i, additional investigation to demonstrate the integrity of the catch basin was conducted as described below.

5.10.2 Phase II Sampling Program

Use of the basin/sump resulted in solid material precipitating along the base and sides of the basin/sump. The sump was cleaned out and inspected and found to have poor integrity. On February 27, 1996, one sample of residue (HLA-SD-1) was collected from the sump and analyzed for: TCLP VOC, TCLP Semivolatiles, TCLP Metals, TPHC, reactivity, ignitability, corrosivity, and PCBs. As indicated in Table 5-26A, the sample indicated the presence of PCBs at a concentration of 1.1 ppm. Due to the presence of PCBs, and the poor integrity of the sump, delineation sampling was conducted during Phase III, as described below.

5.10.3 Phase III Sampling Program

In order to evaluate the potential for a release from this sump, one boring was advanced adjacent to the sump. Since this area is adjacent to sample location E-1, a combined sample was collected (E-1E) to address both potential areas of concern. The sample was collected from a depth of 1.5-2 feet bgs, and was analyzed for PCBs, chlorobenzene, benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene. As indicated on Table 5-22, this sample indicated the presence of chlorobenzene, benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene at concentrations above NJDEP soil cleanup criteria. A second sample (H-1B) was collected below E-1E at a depth of 4-4.5 feet bgs. Since this sample was specifically intended to identify a potential release from PAEC H, the sample was analyzed for PCBs, which is the only parameter present in the pit residue above NJDEP soil cleanup criteria (see Table 5-21). As indicated on Table 5-21, no PCBs were detected in the soil sample H-1B at concentrations above the NJDEP IGSCC.

5.10.4 Conclusions and Recommendations

The residue sample collected from the pit during Phase II indicated the presence of only PCBs at a concentration above NJDEP soil cleanup criteria. Sampling during Phase III did not indicate the presence of PCB contamination in the adjacent soil above NJDEP soil cleanup criteria. Therefore, further investigation in this area will be limited to the investigation of PAEC E, F, G, for delineation surrounding sample location E-1.

5.11 PAEC I: Pits

5.11.1 PAEC I1: Holding Pit

5.11.1.1 Area Description

This concrete pit was associated with final collection of wastewater within the facility wastewater treatment system. PAEC I1 is a 500-gallon holding pit which received all wastewater from the manufacturing facility via gravity flow from an adjacent concrete basin and weir structure (located in PAEC H). Wastewater then flowed by gravity to PAEC I2. The holding pit was constructed after 1981 when the facility began pretreatment of its wastewater prior to discharge to PVSC, and consists of a concrete pipe with a poured concrete base which has been lined using a smaller FRP pipe. The space between the concrete and FRP pipe was filled with grout. Piping to this system was underground and is described in Section 5.9 of this RIR. It is ENSR and Napp's understanding that this structure was original, and did not replace or upgrade another holding pit.

Since most of the materials used at the Subject Site were non-hazardous, wastewater discharged from manufacturing areas of the facility also would be expected to have been non-hazardous and to not contain significant concentrations of contaminants. However, in accordance with N.J.A.C. 7:26E-3.9(e)3.i, additional investigation to demonstrate the integrity of the pit was conducted as described below.

5.11.1.2 Phase I Sampling Program

ENSR collected 1 aqueous and 1 sludge sample from this area on December 8, 1995. The aqueous sample (PT-02) was analyzed for the Full Scan and the sludge sample (PAECI1-WC) was analyzed for waste classification parameters. As indicated in Table 5-27, sample PT-O2 indicated the presence of several volatile organic compounds at individual concentrations ranging from 0.2 parts per billion (ppb) to 28 ppb. In addition, as indicated in Table 5-27A, concentrations of PCBs were not detected in sample PAECI1-WC. The pit was cleaned out and inspected, and the integrity was determined to be good.

5.11.1.3 Conclusions and Recommendations

The integrity of the pit will be confirmed during a proposed joint inspection to be conducted with the NJDEP. Based upon the condition of the pit, and the relatively low levels of detected constituents, there is no evidence to suggest that contamination of the environment may have resulted from this pit. Therefore, no further action is proposed at PAEC-I1 unless the joint

inspection otherwise requires.

5.11.2 PAEC I2: Wastewater Treatment Pit

5.11.2.1 Area Description

This concrete pit was associated with treatment of wastewater within the facility wastewater treatment system. Wastewater flowed by gravity to this approximately 775-gallon pit from PAEC I1. The wastewater was monitored and treated for discharge to PVSC. The pit was constructed after 1981 when the facility began pretreatment of its wastewater. It is ENSR's understanding that this structure was original, and did not replace or upgrade another treatment pit. The pit consists of a concrete pipe with a poured concrete base which has been lined using a smaller FRP pipe. The space between the concrete and FRP pipe was filled with grout. Piping to this system was underground and is described in Section 5.9 of this RIR.

Since most of the materials used at the Subject Site were non-hazardous, process wastewater discharged from manufacturing areas of the facility also would be expected to have been non-hazardous and to not contain significant concentrations of contaminants. In accordance with N.J.A.C. 7:26E-3.9(e)3.i, additional investigation to demonstrate the integrity of the pit was conducted, as described below.

5.11.2.2 Phase I Sampling Program

ENSR collected 1 aqueous sample (PT-O1) from this area on December 8, 1995. This sample was analyzed for the Full Scan. No residual material was observed in the pit during cleanup activities, therefore a sludge sample was not available. As indicated in Table 5-28, the sample indicated the presence of several volatile organic compounds, at individual concentrations ranging from 0.9 ppb to 49 ppb. The pit was cleaned out and inspected, and the integrity was determined to be good.

5.11.2.3 Conclusions and Recommendations

The condition of the pit will be confirmed during a proposed joint inspection to be conducted with the NJDEP. Based upon the condition of the pit, and the relatively low levels of detected constituents, there is no evidence to suggest that contamination of the environment may have resulted from this pit. Therefore, no further action is proposed at PAEC I2 pending the results of joint inspection.

5.11.3 PAEC I3: Utility Access Pits (Manholes #1-3, #5-7)

5.11.3.1 Area Description

Six manholes, believed to provide access to utilities, were observed in the eastern portion of the facility. There is no information to suggest that these pits were upgrades or replacements for preexisting units. Material contained below the manholes was sampled for waste classification purposes. In each case, the materials were found to be nonhazardous. Additionally, there is no evidence that a discharge from these pits, if any, would have impacted the environment. Therefore, sampling or further investigations were not conducted.

Investigation of manholes #1, #2, and #3 has revealed that these are not actual pits, but are in fact access points to the steam tunnel. As shown on Figure 4-3, these manholes are all interconnected. In addition, Manholes #3, #4, and #8 are connected to one another by a pipe. Manholes #5, #6, and #7 are separate vaults, connected to one another by pipes, but not connected to the other manholes.

5.11.3.2 Phase I Sampling Program

ENSR cleaned out and collected various samples from Manholes #1, #2, and #3 during Phase I. The samples collected included the following:

Manhole #1

- One aqueous sample (Manhole 1) was collected on May 9, 1995 and analyzed for benzene, toluene, ethylbenzene, xylene, pH, and TPHC. Results are shown in Table 5-29.

- One aqueous sample (TM1) was collected August 3, 1995 and analyzed for Waste Classification parameters. Results are shown in Table 5-29A.
- Sludge and residue samples (MHSL-01-SC, MHSD-01-SC, MHSL-01-WC and MHSD-01-WC) were collected December 8, 1995 and analyzed for the Full Scan and Waste Classification parameters. Results are shown in Tables 5-30 and 5-30A.

Manhole #2

- Aqueous and sludge samples (TM2 and TM2A) were collected August 3, 1995 and analyzed for Waste Classification parameters. Results are shown in Table 5-29A.

Manhole #3

- One sludge sample (MHSL-03-WC) was collected December 8, 1995, and analyzed for Waste Classification parameters (results shown in Table 5-30A)

Manhole #6

- One aqueous sample (TM6) was collected on August 3, 1995 and analyzed for waste classification parameters. Results are shown in Table 5-31B.

Manhole #7

- One aqueous sample (TM7) was collected on August 3, 1995 and analyzed for waste classification parameters. Results are shown in Table 5-31B.

As indicated in Table 5-30, the sludge in Manhole #1 contained PCBs and TPHC. All of the waste classification samples in all of the manholes sampled were below TCLP criteria. The PCBs detected in manholes #1 and #3 were all identified as Aroclor 1248.

No sampling of Manhole #5 was conducted during Phase I.

5.11.3.3 Phase II Sampling Program

One sludge sample was collected from each of Manholes #5, #6, and #7 on February 27, 1996. Each sample was analyzed for the Full Scan and Waste Classification parameters. As indicated in Tables 5-31 and 5-31A, the sludge in Manhole #5 contained total organics, and the sludge from all three manholes contained elevated concentrations of PCBs. All of the waste classification samples were below TCLP criteria.

The manholes were cleaned out and inspected, and the integrity was determined to be questionable. Manholes #5, #6, and #7 were further investigated during Phase III.

5.11.3.4 Phase III Investigation

On September 30, 1996 ENSR attempted to collect a sample below the base of Manhole #7. The manhole was observed to have an 8- to 12-inch layer of white, chalk-like material at the bottom which appeared to be a sealant. When the material was disturbed, groundwater began seeping into the pit. Therefore, attempts to collect a soil sample were abandoned. The bases of Manholes #5 and #6, as well as the tunnel connecting Manholes #1-3, are also below the

watertable. As a result, no samples were collected beneath any of these structures.

The pits and tunnel are of reasonably good integrity. Hairline cracking was observed in some locations. Additionally, some seepage of water was noted around the seal of the former production well near Manhole #1.

5.11.3.5 Conclusions and Recommendations

The pits and tunnels comprising PAEC I3 were never used by Napp. According to information obtained during a review of Hexcel files, the tunnel appears to be part of a steam tunnel which was originally used by UPDW as a conduit for steam and water piping. According to an October 20, 1986 letter from ENVIRON to NJDEP, the tunnel originated from the UPDW power station located near City Hall. The tunnel was walled off before extending beneath Molnar Way prior to Hexcel's purchase of the property. Based on ENSR's review of the Hexcel files, it appears the tunnels are currently used to access the City water pipes for maintenance purposes.

The PCB aroclors detected in Manholes #1 and #3 were identified as aroclor 1248. Hexcel file data indicates that the aroclors detected at the Hexcel facility historically have been 1242 and 1248. A review of data collected throughout the Napp facility indicates almost entirely aroclors 1254 and 1260. Additionally, there is no information indicating PCBs were associated with Napp's operations. This data indicates that the PCBs in these structures and any potential impact on the environment from these units would be the result of either activities conducted by UPDW, or on the adjacent Hexcel property. The fact that there is no known use of the pits and tunnel by Napp supports this position.

In summary, there are no known impacts to the environment from this PAEC which are attributable to Napp. Sludge present in the tunnels and pits has been removed by Napp. Further investigation of the soil below the pits or tunnel would result in creating a conduit to groundwater. No further soil investigation or remediation of this PAEC is proposed.

5.11.4 PAEC I4: Manhole #4

5.11.4.1 Area Description

This PAEC is a brick-lined pit, the usage of which is unknown. There is no information to suggest that this pit was an upgrade or replacement of a preexisting unit. The pit is connected by pipe to Manholes #3 and #8. This pit appears also to be connected by pipe to the vault found below the boiler room (refer to PAEC T). In accordance with N.J.A.C. 7:26E-3.9(d)1, additional investigation to demonstrate the integrity of the pit was conducted, as described

below.

5.11.4.2 Phase I Sampling Program

The pit was cleaned out and the removed material was sampled for waste classification purposes. One sludge sample (TM4) was collected August 3, 1995, and analyzed for Waste Classification parameters. As summarized in Table 5-32A, all of the parameters were below RCRA criteria. The residue from the pit indicated the presence of a total petroleum hydrocarbon (TPHC) concentration of 5,000 ppm. Based upon visual inspection, the integrity of the pit appears to be good. Although there is no evidence of any discharge from the pit, the elevated TPHC concentration in the residual matter led to additional sampling during Phase III.

5.11.4.3 Phase III Sampling Program

In order to evaluate the potential for a discharge to the environment, one boring was advanced through this pit. One sample was collected from 0-0.5 feet above the saturated zone. The sample was analyzed for TPHC. As indicated on Table 5-32, the TPHC concentration in the sample was below all NJDEP soil cleanup criteria.

5.11.4.4 Conclusions and Recommendations

The condition of the pit will be confirmed during a proposed joint inspection to be conducted with the NJDEP. Sampling below the pit did not indicate the presence of any historic discharge from this PAEC. Therefore, no further investigation of this area is proposed pending the results of the joint inspection.

5.11.5 PAEC I5: Manhole #8

5.11.5.1 Area Description

This PAEC appears to be a brick-lined pit, the usage of which is unknown. There is no information to suggest that this pit was an upgrade or replacement for a preexisting unit. The pit is connected by pipe to Manhole #4, which in turn appears to be connected by pipe to the vault found below the boiler room (refer to PAEC T). In accordance with N.J.A.C. 7:26E-3.9(d)1, additional investigation to demonstrate the integrity of the pit was conducted, as described below.

5.11.5.2 Phase I Sampling Program

The pit was cleaned out and material removed was sampled for waste classification purposes. One sludge sample (TM8) was collected August 3, 1995, and analyzed for Waste Classification parameters. As summarized in Table 5-33A, most of the parameters were below RCRA criteria. The residue from the pit indicated the presence of a TPHC concentration of 41,800 ppm. Although there is no evidence of any discharge from the pit, the elevated TPHC concentration in the residual led to additional sampling.

5.11.5.3 Phase III Sampling Program

In order to evaluate the potential for a discharge to the environment, one boring was advanced through this pit. Two samples were collected at depths of 3-3.5 feet bgs and 4.5-5 feet bgs (the intervals immediately below the pit base and from 0-0.5 feet above the saturated zone). The samples were analyzed for TPHC. As indicated on Table 5-33, the TPHC concentrations in the samples were below all NJDEP soil cleanup criteria.

5.11.5.4 Conclusions and Recommendations

The condition of the pit will be confirmed during a proposed joint inspection to be conducted with the NJDEP. Sampling below the pit did not indicate the presence of any historic discharge from this PAEC. Therefore, no further investigation of this area is proposed pending the results of the joint inspection.

5.12 PAEC J: Hazardous Waste Storage Area

5.12.1 Area Description

The facility hazardous waste accumulation area was located to the east of the drum storage area. The approximately 8 feet by 15 feet area was segregated from the facility by a fence, but was not curbed. According to Napp personnel, this area and the surrounding area was paved in approximately 1978. The paved area is sloped so that drainage entered the adjacent trench drain and discharged to the facility wastewater treatment system. The pavement in this area is in fair condition. There is no visible evidence of a discharge from this area.

A concrete-lined pit is located to the east of the hazardous waste storage area. Several pipes were observed in this pit. This pit is believed to have been part of the existing PVSC system, and flows directly to PVSC. The condition of the pit will be confirmed during a proposed joint inspection to be conducted with the NJDEP. The pit and the drain in the storage area are not

connected.

According to Napp personnel, this is the only known Napp hazardous waste storage area at the facility. Temporary satellite storage of single drums was conducted in Buildings 3 and 5 and outside of the maintenance shop. However, these areas were located on concrete floors, with drains discharging to the wastewater collection system to capture any spills which may have occurred.

5.12.2 Phase II Sampling Program

ENSR collected one sample (HP-1) from residue at the base of the pit on July 17, 1996. The sample was analyzed for the Full Scan and waste classification parameters.

The analytical results for the sample collected from this area of concern are provided in Tables 5-34 and 5-34A. The sample indicated the presence of VOC, BN, phenol, cadmium, selenium, PCB, and TPHC at concentrations above NJDEP soil cleanup criteria. Further investigation was conducted during Phase III activities.

5.12.3 Phase III Sampling Program

In order to evaluate whether a discharge may have occurred from this pit, five borings were advanced in this area. Borings were advanced adjacent to the pit, and to the north, south, east, and west of the pit. All borings were sampled from a depth of approximately 5.5-6 feet bgs, which corresponds to the depth of the pit base, as well as the approximate depth to groundwater. Sample locations are shown on Figure 4-1. All samples were analyzed for TPHC, PCBs, chlorobenzene, toluene, xylene, 1,2-dichlorobenzene, phenol, cadmium, and selenium.

As indicated in Table 5-35, all five samples indicated the presence of VOCs above the NJDEP IGSCC (Figure 5-8). In addition, sample J-1D indicated the presence of phenol and PCBs at concentrations above the NJDEP IGSCC. The remaining borings indicated all other parameters were below the NJDEP IGSCC.

5.12.4 Conclusions and Recommendations

Based upon the results of Phase III sampling, delineation of the hazardous waste storage area to the NJDEP IGSCC is not complete.

1. Sample Location J-1D.

Further delineation for phenol and PCBs surrounding sample J-1D is described below. All proposed sampling locations are shown on Figure 5-10.

Vertical: A soil sample (J-1D) was collected from sample location J-1D at a depth of 5.5-6 feet bgs (depth of the base of the pit). PCBs and phenol were detected in sample J-1D at concentrations above the NJDEP IGSCC.

One soil boring (J-1D-D) will be advanced adjacent to sample location J-1D to vertically delineate sample J-1D. Samples will be collected at 0.5-1 feet bgs, 3-3.5 feet bgs, 8-8.5 feet bgs and 0-0.5 feet above silt/clay layer. Samples will be collected for phenol analysis at sample depths of 0.5-1 feet bgs and 3-3.5 feet bgs. Samples will be collected for PCB analysis at each of the four sample depths. PCB samples collected at the depths of 0.5-1 feet bgs and 0-0.5 feet above the silt/clay layer will be held at the laboratory for one week pending the analytical results for the samples collected at 3-3.5 feet bgs and 8-8.5 bgs.

Proposed sample J-1D-D will also be used delineate chlorobenzene, toluene and xylene concentrations detected in samples J-1A, J-1B, J-1C, J-1D and J-1E above the NJDEP IGSCC, therefore these VOC compounds will be added to the analysis as discussed below.

Delineation will be conducted horizontally from sample location J-1D to the north, south and west as described below. Samples will also be collected vertically at each of these horizontal locations.

North: PCB and phenol delineation in the surface interval to the north of sample location J-1D is considered complete to the NJDEP IGSCC at sample location V5 at a depth of 0.67-1.17 feet bgs. The PCBs and phenol results for sample V5 are below the NJDEP IGSCC.

Additional samples will be collected adjacent to sample location V5 (V5-4) for delineation to the north. Soil samples will be collected at 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer. Since the surface interval has already been delineated by sample V5, the 0.5-1.0 foot interval will not be sampled. Samples will be analyzed for phenol at 3-3.5 feet bgs and 0-0.5 feet bgs above the saturated zone. Samples will analyzed for PCBs at all four depths. The samples collected from depths of 3-3.5 feet bgs depth, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer will be held at the laboratory for one week pending the analytical results for the sample collected at 0-0.5 feet above the saturated zone.

Proposed sample V5-4 also delineates this area, therefore additional VOC compounds will be added to the analysis as described below.

East: PCB and phenol delineation to the east of sample J-1D is considered complete to below the NJDEP IGSCC at sample locations V1-1 (0.4-0.9 feet bgs), V1-1D (0.9-1.3 feet bgs) and V1-1A (V1-1A4 (3.5-4 feet bgs) and V1-1A6 (5.5-6 feet bgs)). PCB and phenol concentrations for samples V1-1, V1-1D and V1-1A were detected at concentrations below the NJDEP IGSCC.

No additional samples are proposed to the east of sample location J-1D.

South: PCB and phenol delineation to the south of sample J-1D in the surface interval and at 0-0.5 feet above the saturated zone is considered complete to below the NJDEP IGSCC at sample locations V7 and J-1E. Sample V7 was collected at 1.0-1.42 feet bgs and sample J-1E was collected at 5.5-6.0 feet bgs.

An additional boring (V7-4) will be advanced adjacent to sample location V7 to conduct additional delineation to the south. Samples will be collected at 3.0-3.5 feet bgs, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer. Since the surface interval and the interval of 0-0.5 feet above the saturated zone have been delineated by samples V7 and J-1E, these intervals will not be sampled. Since phenol delineation will not extend into the saturated zone, only the sample depth of 3.0-3.5 feet bgs will be analyzed for phenol. Samples at depths of 3-3.5 feet bgs, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer will be analyzed for PCBs. The PCBs sample collected at a depth of 0-0.5 feet above the silt/clay layer will be held at the laboratory for one week pending the analytical results from the sample collected at 0-0.5 feet above the saturated zone.

West: PCBs and phenol delineation in the interval 0-0.5 feet above the saturated zone to the west of sample location J-1D is considered complete to the NJDEP IGSCC at sample J-1A collected at a depth of 5.5-6 feet bgs. The PCB and phenol results for sample J-1A were below the NJDEP IGSCC.

An additional boring (J-1D-D) will be placed adjacent to sample location J-1A to conduct additional delineation to the west. Due to the close proximity of sample location J-1D to sample location J-1A, this western delineation sample has been combined with the vertical delineation sample for J-1D. Samples will be collected at 0.5-1 feet bgs, 3-3.5 feet bgs, 8-8.5 feet bgs and 0-0.5 feet above silt/clay layer. Phenol analysis will be performed for sample depths 0.5-1 feet bgs and 3-3.5 feet bgs. Samples will be collected for PCB analysis at all of the sample depths 0.5-1 feet bgs, 3-3.5 feet, 8-8.5 feet bgs and 0-0.5 feet above silt/clay layer. PCB samples collected at the depths of 0.5-1 feet bgs and 0-0.5 feet above the silt/clay layer will be held at

the laboratory for one week pending the analytical results from the sample collected at 3-3.5 feet bgs. Based on the results of this sample a decision will made regarding analysis of the remaining two samples.

2. Sample Locations J-1A, J-1B, J-1C, J-1D and J.1E.

Further delineation will be conducted surrounding sample J-1A, J-1B, J-1C, J-1D and J-1E as described below. All proposed sampling locations are shown in Figure 5-10.

Soil sample locations J-1A, J-1B, J-1C, J-1D and J-1E were partially horizontally delineated during Phase III. A discussion of the results of previously collected samples and the additional proposed delineation samples is provided below.

Vertical: Soil samples J-1A, J-1B, J-1C, J-1D and J-1E were collected at a depth of 5.5-6 feet bgs (depth of the base of the pit). Chlorobenzene, toluene and xylene were detected in the samples at concentrations above the NJDEP IGSCC.

One soil boring (J-1D-D) will be advanced adjacent to sample location J-1D to vertically delineate samples J-1A, J-1B, J-1C, J-1D and J-1E. Samples will be collected at 0.5-1.0 feet bgs and 0-0.5 feet above the saturated zone and will be analyzed for chlorobenzene, toluene and xylene. Sample J-1D-D will also delineate the PCB and phenol concentrations detected above the NJDEP IGSCC at sample location J-1D, therefore sampling for PCBs and phenol as previously described will be also be conducted at this sample location.

Delineation will be conducted horizontally from sample locations J-1A, J-1B, J-1C, J-1D and J-1E to the north, south, east and west as described below. Samples also will be collected vertically at each of these horizontal locations.

North: Chlorobenzene, toluene and xylene delineation in the surface interval to the north of sample locations J-1A, J-1B, J-1C, J-1D and J-1E is considered complete to the NJDEP IGSCC at sample V5 collected at approximately 1-1.5 feet bgs. The chlorobenzene, toluene and xylene results for sample V5 were below the NJDEP IGSCC.

An additional boring (V5-4) will be advanced adjacent to sample location V5 to conduct additional delineation to the north of samples J-1A, J-1B, J-1C, J-1D and J-1E. Samples will be collected at 3-3.5 feet bgs and 0-0.5 feet above the saturated zone, and will be analyzed for chlorobenzene, toluene and xylene. Soil sample location V5-4 also will delineate the PCB and phenol detected in sample J-1D, therefore additional depths and compounds will be added to sample V5-4 as previously described.

East: Chlorobenzene, toluene and xylene delineation in the surface interval to the east of sample locations J-1A, J-1B, J-1C, J-1D and J-1E is considered complete to the NJDEP IGSCC at sample V7 collected at a depth of 1-1.5 feet bgs. The chlorobenzene, toluene and xylene results for sample V7 were below the NJDEP IGSCC.

An additional boring (V7-4) will be advanced adjacent to sample location V7 to conduct additional delineation to the east of sample locations J-1A, J-1B, J-1C, J-1D and J-1E. Samples will be collected at 3-3.5 feet bgs and 0-0.5 feet above the saturated zone and will be analyzed for chlorobenzene, toluene and xylene. Proposed sample location (V7-4) also delineates PCBs and phenol at sample location J-1D, therefore additional depths and compounds will be added to sample V7-4.

South: Chlorobenzene, toluene and xylene delineation in the surface interval to the south of sample locations J-1A, J-1B, J-1C, J-1D and J-1E is considered complete to the NJDEP IGSCC at sample location V6 collected at a depth of approximately 1-1.5 feet bgs. The chlorobenzene, toluene and xylene results for sample V6 were below the NJDEP IGSCC.

An additional boring (V6-4) will be advanced adjacent to sample location V6 to conduct additional delineation to the south of sample locations J-1A, J-1B, J-1C, J-1D and J-1E. Two samples will be collected at depths of 3-3.5 feet bgs and 0-0.5 feet above the saturated zone and will be analyzed for chlorobenzene, toluene and xylene.

West: Chlorobenzene, toluene and xylene delineation in the surface interval to the west of sample locations J-1A, J-1B, J-1C, J-1D and J-1E is considered complete to below the NJDEP IGSCC at sample M-1 collected at a depth of 1.8-2.3 feet bgs. The chlorobenzene, toluene and xylene results for sample M-1 were below the NJDEP IGSCC.

An additional boring (M-1B-4) will be advanced adjacent to sample location M-1 to conduct additional delineation to the west of sample locations J-1A, J-1B, J-1C, J-1D and J-1E. Two samples will be collected at 3-3.5 feet bgs and 0-0.5 feet above the saturated zone and will be analyzed for chlorobenzene, toluene and xylene.

As discussed in Section 5.3, the soil in this area has been identified as historic fill.

5.13 PAEC K: Manufacturing Building Loading Dock Area

A covered loading dock is located on the northwest side of the manufacturing building. This area was used for loading and unloading of raw materials, generally in quantities of 55-gallons or less. The loading ramp and loading dock are constructed of concrete and cover an area of

approximately 15 feet by 45 feet. A drain is located at the base of the loading ramp and is discussed below. Based upon visual observation, the loading dock is in good condition, with only surficial hairline cracks, and is surrounded by impervious surfaces. The integrity of the loading ramp was inspected and several cracks were observed. However, there is no evidence or record of any discharges in this area. As a result, there is no reason to suspect a discharge from the loading dock or ramp has occurred, or if one did, that it impacted the environment. As indicated on Table 5-36, sample LD was collected from storm water in this area on June 30, 1995, and was found to be non-hazardous. As a result, sampling or further investigations were not conducted.

A trench drain is located in the covered loading dock on the northwest side of the manufacturing building. The drain is located at the base of the loading ramp, which has a steep downgrade. The drain was equipped with a sump pump for removal of storm water. During facility operation, storm water runoff was visually inspected, and then pumped into the paved parking area located in the northwest corner of the property if no contamination was observed. Visually contaminated water was drummed, tested and appropriately disposed based on the analytical results. The integrity of this drain was determined to be good and will be confirmed during a proposed joint inspection to be conducted with the NJDEP. No further action is proposed for this area.

5.14 PAEC L: Tank Loading Area

A truck unloading area for the aboveground storage tanks is located near the southeast corner of the Tank Farm (PAEC A). Curbing is provided on three sides, and the surrounding area is paved. The base and curbs for this PAEC are asphalt. The area was resurfaced in 1984-1985 as part of routine maintenance. The area slopes towards the front of the PAEC to a drain which is part of the wastewater collection system. The asphalt paving in this area appears to be in good condition. There is no evidence of a discharge to the environment in this area, or if there was, that such a discharge impacted the environment.

Spills, leaks, and stormwater accumulation from the unloading area collected in the drain and were discharged to the facility wastewater treatment system. The integrity of this drain was evaluated and found to be good. The integrity of the drain will be confirmed during a proposed joint inspection to be conducted with the NJDEP.

Although not specifically targeted, the soils in PAEC L have been sampled as part of the investigation of PAEC J. Sample J1-1D was collected in the center of PAEC L, and found to indicate the presence of VOCs, phenol, and PCBs at concentrations above NJDEP IGSCC. This area will be addressed further through the delineation of PAEC J.

5.15 PAEC M: Drum Storage Area

5.15.1 Area Description

55-gallon drums and steel tote containers of hazardous and non-hazardous raw materials, as well as empty containers, were stored on the west side of the manufacturing building within an asphalt paved area. Based upon a review of aerial surveys for the Subject Site, this area was paved sometime between 1971 and 1974. Aerial photographs taken before 1971 indicate that this portion of the Subject Site was unpaved and may have been used as an access roadway by the previous facility owners, or other adjacent industries. A 1974 survey indicates that the area was partially paved, and was used to store material containers.

The existing drum storage area is approximately 5,740 square feet and is surrounded on the west and south sides by a 6- to 8-inch formed asphalt curb installed in 1990. The asphalt base of the area was resurfaced in 1993 and appears to be in good condition. Drainage from the drum storage area entered a drain and catch basin which discharged directly to PAEC I2 which is part of the wastewater treatment system. This portion of the wastewater collection system (the drain, catch basin and piping to the wastewater treatment system) was installed in 1992 and appeared to be in good condition. The integrity of the drain and catch basin will be confirmed during a proposed joint inspection to be conducted with the NJDEP. The wastewater piping was aboveground and has been removed. The piping was inspected prior to removal and appeared to have good integrity.

This portion of the existing wastewater collection system, which was installed in the mid-1980s, replaced the former dry well, PAEC O1. PAEC 01 is located within PAEC M. Details regarding the status of the wastewater collection system prior to 1981 are not known, nor are the potential impacts from previous material storage activities in the area. Sampling of this area was performed, as described below.

5.15.2 Phase II Sampling Program

ENSR collected two samples and one duplicate (M-1 through M-3) from this area on April 23, 1996. Figure 4-1 provides sample locations. Due to poor sample recovery in the split spoon, the samples were collected from a depth of approximately 0.5 to 2.5 feet, and were analyzed for the Full Scan.

As indicated in Table 5-37, PCBs were found in samples M-1 and M-2 at concentrations below the NJDEP IGSCC. Phenol was detected in sample M-1 at a concentration above the NJDEP IGSCC. Additionally, the duplicate sample, M-3, indicated the presence of PCBs at a

concentration above the NJDEP IGSCC, and TPHC at a concentration above the total organic cap.

5.15.3 Phase III Sampling Program

In order to delineate this area, samples were collected below and to the north, south, east, and west of sample locations M-1, M-2, and O1-1[19]. A total of 11 additional borings were advanced during Phase III in the locations shown on Figure 4-1. Samples from each boring were collected from a depth of 0-0.5 feet bgs. Additionally, samples from borings below the original sample locations, as well as from four selected surrounding borings were also collected from a depth of 0-0.5 feet above the saturated zone. All samples were analyzed for PCBs, phenol, TPHC, chromium, hexavalent chromium (Cr^{+6}), and copper.

As indicated in Table 5-38 and Table 5-41 only two samples in PAEC M indicated constituents above the NJDEP IGSCC: sample M-1A Bottom indicated the presence of phenol at a concentration above the NJDEP IGSCC; and, sample O1-1B Top indicated the presence of PCBs at concentrations above the NJDEP IGSCC. Delineation for sample M-1A Bottom has been completed and further delineation is proposed for sample O1-1B Top, as described below.

5.15.4 Conclusions and Recommendations

Samples M-1 and M-1A Bottom were collected at depths of 0-0.8-2.3 feet bgs and 4.5-5.0 feet bgs, respectively, at sample location M-1. Phenol was detected in sample M-1 and M-1A Bottom at concentrations above NJDEP IGSCC. Since phenol delineation will not extend into the saturated zone, contamination within the saturated zone will be considered vertically delineated by the silt/clay layer and will be further investigated by the groundwater investigation.

Based upon the results of Phase III sampling, delineation horizontally from sample locations M-1 and M-1A Bottom has been completed. Further delineation is not proposed for samples M-1 and M-1A Bottom.

1. Sample Location 01-1B.

PCBs were detected at sample location O1-1B[20] Top in the sample collected from the surface

[19] Phase IV sampling includes PAEC 01 with PAEC M because PAEC 01 is located within PAEC M, as discussed in Section 5.17.

[20] Phase IV sampling includes PAEC 01 with PAEC M because PAEC 01 is located within PAEC M, as discussed in Section 5.17.

interval at a concentration above NJDEP IGSCC. Delineation of this compound will be conducted as described below.

Vertical: One boring (O1-1B-4) will be advanced adjacent to sample location O1-1B to vertically delineate sample O1-1B Top. Samples will be collected for PCBs at depths of 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer. Samples collected from depths of 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer will be held at the laboratory for one week pending the analytical results of the PCBs sample collected at 0-0.5 feet above the saturated zone.

Delineation will be conducted horizontally from sample location O1-1B to the north as described below. Samples will also be collected vertically at each of the horizontal locations.

North: PCB delineation in the surface interval to the northeast of sample location O1-1B is considered complete to below the NJDEP IGSCC at sample location O1-1C collected at a depth of 1.5-2 feet bgs. The PCB result for sample O1-1C is below the NJDEP IGSCC.

To confirm the northerly direction, an additional boring (01-1B-D1) will be advanced adjacent to sample location O1-1B to conduct additional delineation to the north of sample O1-1B. Samples will be collected for PCB analysis at depths of 3.0-3.5 feet bgs, 0-0.5 feet above the saturated zone, 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer. Samples collected from depths of 8.0-8.5 feet bgs and 0-0.5 feet above the silt/clay layer will be held at the laboratory for one week pending the analytical results of the PCBs sample collected at 0-0.5 feet above the saturated zone.

East: PCB delineation in the surface and 0-0.5 feet above the saturated zone intervals to the east of sample O1-1B is considered complete to the NJDEP IGSCC at sample O1-1A collected at depths of 0.5-1 feet bgs (Top) and 5.5-6 feet bgs (Bottom).

No further delineation is proposed to the east of sample location O1-1B.

South: PCB delineation to the south of sample location O1-1B is considered complete to the NJDEP IGSCC at sample locations M-2, M-2A top, M-2 bottom and M-2D collected at 1.9-2.4 feet bgs, 0.5-1 feet bgs, 5.5-6 feet bgs and 0.5-0.92 feet bgs, respectively. The PCB results for samples M-2, M-2A top, M-2B bottom and M-2D are below the NJDEP IGSCC.

No further delineation is proposed to the south of sample location O1-1B.

West: Sample O1-1B is delineated to the west by the property line located approximately 5 feet from sample O1-1B.

5.16 PAEC N: Dumpster

5.16.1 Area Description

One dumpster, approximately 30 cubic feet capacity, was used at the facility for collection of general trash. This dumpster was located on the southwest side of the manufacturing building, adjacent to the fire pumphouse, on a concrete pad. This pad is surrounded by a concrete curb and stormwater was discharged to PVSC. The dumpster was not used for storage of hazardous or industrial wastes. There is no evidence, or reason to suspect, that the dumpster has resulted in any contamination of the environment. No further investigation of the dumpster pad was proposed. The proposal for no further action was approved by NJDEP in its October 1, 1996 letter.

A drain is located between the fire pumphouse and trash dumpster. This drain received runoff from the paved employee parking area, located on the southwest side of the facility. Accumulated wastewater entered the wastewater collection system piping and flowed to the sumps located in the P&B area (PAEC G1), and ultimately discharged to the facility wastewater treatment system. Visual inspections of this drain indicated that its integrity was good. The integrity of the drain will be confirmed during a proposed joint inspection to be conducted with the NJDEP.

5.16.2 Phase II Sampling Activities

On July 17, 1996 ENSR collected one sample (DPT-WC) from residue contained within the trench drain. As indicated in Table 5-39A, the sample indicated a PCB concentration of 12 ppm, which is below the NJDEP IGSCC.

5.16.3 Conclusions and Recommendations

The residue sample from the trench drain indicated a PCB concentration below the NJDEP IGSCC. In addition, the integrity of the drain is good, and there is no pathway for the residue to migrate to the environment. Therefore, no further investigation of this area is proposed.

5.17 PAEC O: Dry Wells

5.17.1 PAEC O1: Dry Well West of PAEC M

5.17.1.1 Area Description

According to historic site sketches, one dry well was located on the west side of the facility. This area of the facility was historically used for storage of raw material and waste drums, and portable containers. The dry well was utilized for collection of stormwater runoff from the storage area. Napp has no records concerning the construction of the dry well. The exact location and dimensions are unknown. This system was replaced when the current drain, catch basin and piping were installed in 1992. After that time, all runoff from the area was collected in the drain and catch basin, and discharged to the facility wastewater treatment system. No investigative activities were conducted at the time the dry well was replaced. Therefore, in accordance with N.J.A.C. 7:26E-3.9(e)3.iii, sampling was implemented, as described below.

5.17.1.2 Phase II Sampling Program

Napp personnel were unable to provide the exact location of the former dry well. Therefore, ENSR advanced three borings in the presumed general location of the dry well, based upon the historic sketch. No evidence of a dry well was found. Therefore, ENSR selected a central location and collected one sample (O1-1) from this area on April 23, 1996. Figure 4-1 provides the sample location. Due to poor sample recovery in the split spoon, the sample was collected from a depth of approximately 2.5 to 4.5 feet bgs, and was analyzed for the Full Scan. Table 5-40 summarizes the results for sample O1-1. The sample depth was selected based upon the known depth of former dry well O2, located in the courtyard, on the assumption that both dry wells were of similar construction.

5.17.1.3 Phase III Sampling Program

As previously discussed, due to the similarities of the constituents found in PAEC 01 and PAEC M and the absence of an identifiable former dry well, PAEC 01 has been combined with PAEC M for further investigative activities. Additional sampling was conducted during Phase III to delineate areas where compounds exceeded NJDEP soil cleanup criteria as discussed in Section 5.15.3. Samples proposed in the Phase IV sampling program will delineate existing samples to below the NJDEP IGSCC. As indicated on Table 5-41, the sample collected from O1-1B Top contained PCBs at a concentration above the NJDEP IGSCC.

5.17.2 PAEC O2: Dry Well in Courtyard

5.17.2.1 Area Description

A dry well was located in the courtyard area to the east of Buildings #3 and #5. According to Napp personnel, the dry well was lined with concrete and converted to a sump/pit. In 1992 the dry well was replaced with a closed manhole (Pump Station #4, PAEC F4). No investigative activities were conducted at the time the dry well was replaced. No information was available regarding the replacement of the dry well. Specific details regarding construction of the dry well are not available. However, according to Napp personnel, the dry well was approximately the same dimensions as the adjacent catch basin (PAEC F4). The catch basin is approximately 2 feet diameter by 4 feet deep. The dry well was utilized for collection of stormwater from the courtyard area. A drum transfer area for materials to be added to the reaction processes was also located in the courtyard.

One 10,000-gallon and one 4,000-gallon non-contact cooling water aboveground storage tanks (PAEC C) also were located in the courtyard. The 10,000-gallon tank was installed prior to 1977 and the 4,000-gallon tank was installed in 1979. Catch basins were installed within the containment basin surrounding the two aboveground storage tanks. The catch basins were connected to the wastewater treatment system.

5.17.2.2 Phase II Sampling Program

ENSR collected one sample (O2-1) on April 22, 1996 from a location adjacent to the former dry well. Figure 4-1 illustrates the sample location. A sample depth of 3 feet initially was selected, which is the depth of the base of the existing catch basin and sump. Due to poor sample recovery in the split spoon, a sample collected from a depth of 4.5-5.0 feet bgs was analyzed for the Full Scan.

As indicated in Table 5-42, the sample indicated the presence of benzene and phenol at concentrations above the NJDEP IGSCC. Additionally, the total organic cap was exceeded, primarily by semi-volatile library search compounds.

5.17.2.3 Phase III Sampling Program

In order to delineate PAEC O2, five additional borings were installed adjacent to and to the north, south, east, and west of sample location O2-1. The boring adjacent to O2-1 (O2-1A) was sampled at a depth of 0-0.5 feet above the saturated zone. The four surrounding borings were sampled at depths of 0-0.5 feet bgs and 0-0.5 feet above the saturated zone. Each sample was

analyzed for VOC+10, phenol, and BN+15. As indicated in Table 5-43, all delineation samples in PAEC O2 were below NJDEP IGSCC.

5.17.2.4 Conclusions and Recommendations

As described above, this area has been delineated to the NJDEP IGSCC. No additional delineation is recommended.

5.18 PAEC P: Outfall

5.18.1 Area Description

Stormwater expected to be uncontaminated was discharged to the Saddle River from a single outfall located in the northwest corner of the property. This discharge point consisted of an 8-inch diameter reinforced concrete pipe. This system was kept closed during non-operating hours. There is no history of hazardous material or waste releases from the outfall. Results of surface and sediment samples are summarized on Figure 5-9 and Tables 5-44 through 5-48.

5.18.2 Emergency Response Activities

Prior to ENSR's presence on-site, sampling was conducted by EPA's contractor, Roy F. Weston, Inc., by Kroll Environmental, and by Clean Ventures. Details regarding sample locations from some of the samples collected by Roy F. Weston, Inc. have been requested, but have not been provided to ENSR.

As indicated in Table 5-44 a total of 8 water samples were collected by Weston, in addition to duplicates and trip blanks. These samples were collected on the day of the fire/explosion and were identified as "inlet water", "source water", "downstream water", "upstream water", and "Midland/River water". Results of these samples indicated the presence of benzene and chlorinated VOCs, bis(2-ethylhexyl)phthalate, and various metals at concentrations above the NJDEP Surface Water Quality Standards ("SWQS")[21]. In addition, the "inlet sample" indicated PCBs and phenol above the NJDEP SWQS.

As indicated in Table 5-45, a total of 21 water samples were collected by Clean Ventures from three sample locations on April 24, 1995 (three days after the explosion). These samples

[21] Although it is not known if all of these samples are of surface water, the SWQS are used for comparison purposes.

included river water upstream and downstream of the Subject Site, as well as at the outfall. These data indicated the presence of benzene and manganese at concentrations above the NJDEP SWQS.

As indicated in Table 5-46, a total of four water samples were collected by Kroll Environmental Enterprises, Inc. These samples were collected four days after the explosion and included river water upstream and downstream of the Subject Site. These data indicated the presence of cadmium, lead, and manganese at concentrations above the NJDEP SWQS. These samples reportedly were at the same location as samples NTB011, NTB012, NTB013 and NTB014 collected by EPA's contractor, Roy F. Weston.

In order to better evaluate the data initially obtained, additional sampling of the Saddle River was conducted by ENSR under the direction of NJDEP and local officials during Phase I.

5.18.3 Phase I Activities

Testing was conducted to determine the potential effect of the explosion/fire on the river sediments and aquatic life in the river. Two sediment samples, SED-UP and SED-DOWN, were collected on April 28, 1995. Sediment sample locations and analytical parameters were established at the direction of NJDEP's on-site coordinator for the emergency response. Sediment samples were collected well beyond the property boundaries of the Subject Site -- approximately 600 feet upstream of the Napp storm sewer outfall and approximately 600 feet downstream of the Napp storm sewer outfall and analyzed for pH, PCBs, TOC, and phenols. These data are summarized on Table 5-47 and are depicted on Figure 4-2. Grain size analysis also was conducted.

Table 5-47 shows downstream at 0.90 ppm

PCBs were detected upstream of the Subject Site, but not in the downstream sample. No phenols were detected at either location. The absence of phenols in the sediment samples is significant for several reasons. First, it is expected that many of the compounds used by Napp would have decomposed to phenol during the April 21, 1995 fire and explosion. The fact that phenol was not detected in the sediment indicates the fire and explosion did not have an identifiable impact on the river. Secondly, this data also indicates that Napp's use of phenol at the Subject Site has not impacted the river.

As requested by EPA and NJDEP, toxicological testing also was conducted on the river sediment. A copy of the toxicity report was previously submitted to NJDEP in the PA (February 1996) for the facility. First, an analysis of benthic macroinvertebrate samples was conducted. This analysis indicated that the density and diversity of organisms were fairly low in both the upstream and downstream samples. This is indicative of historically disturbed systems that

received moderate to high levels of pollution. In addition to the benthic analysis, acute toxicity and chronic toxicity analyses of the sediment were conducted. The results of the acute toxicity analysis indicated a survival rate of the test organisms (*daphnia magna*) of 100% in both the upstream and downstream samples, with no significant differences between the two samples. The results of the chronic toxicity analysis indicated a survival rate of the test organisms (*hyalella azteca*) of 91% and 88% in the upstream and downstream samples, respectively, both of which were greater than the survival rate of 81% which was observed in the control sample. The results of the environmental and toxicity testing indicate that no adverse chemical or biological effects are observable as a result of operations at the Subject Site.

In summary, the sample data indicate that river conditions are essentially the same upgradient and downgradient of the Subject Site. This indicates that there have been no significant discharges from the facility to the river, either historically or as a result of the explosion/fire, which have adversely affected the environment. As a result, sampling or further investigations was not proposed in the February 1996 RIWP.

5.18.4 Phase III Sampling Program

This PAEC was not addressed during Phase II activities. However, as a result of discussions with NJDEP at the May 7, 1996 meeting, ENSR collected three additional sediment samples from the Saddle River during Phase III. Each sample was collected from the midpoint of the river at the locations shown on Figure 4-2. Samples P-1, P-2, and P-3 were collected immediately upstream of the Subject Site, opposite the outfall, and immediately downstream of the Subject Site, respectively. As requested by NJDEP in the May 7, 1996 meeting, the samples were analyzed for BN+15, phenol, cadmium, and PCBs based upon the constituents found in residual material removed from the storm sewer (discussed under PAEC Y).

Sample data were evaluated based on the Sediment Quality Criteria and Biological Effects Screening Levels provided in the March 1991 NJDEP Draft "Guidance For Sediment Quality Evaluations". Concentrations of acenaphthene, phenanthrene, and PCBs were compared to the Sediment Quality Criteria, using a TOC value of 7010 ppm, which is the average of the two TOC values obtained during the April 1995 sampling event. As indicated on Table 5-48, none of the compounds exceeded the upper confidence level which NJDEP recommends using for urban waterways. Concentrations of various PAHs were compared to the Biological Effects Screening Levels. No compounds exceeded the median of the effects range.

5.18.5 Conclusions and Recommendations

Concentrations of contaminants in sediment samples were below the applicable criteria for urban

waterways. Additionally, the toxicological testing conducted by ENSR confirms that there has been no measurable effect on the river as a result of Napp operations. No further action is proposed relative to this PAEC.

5.19 PAEC Q: Electrical Transformers

Three pole-mounted transformers were located around the facility outside the property boundary of the Subject Site. The locations of the pole-mounted transformers are indicated on Figure 4-3. These pole-mounte transformers were also owned and maintained by Public Service Electric and Gas (PSE&G). As indicated in letters from PSE&G, provided as Attachment 3 of Appendix B[22], these units did not contain PCBs and were not damaged during the April 21, 1995 incident. No evidence of releases from these pole-mounted units have been observed, heretofore, they have not been identified as a PAEC. As a result, sampling or further investigations were not conducted for the transformers located off-site.

Electrical service was provided to the facility by PSE&G. The two transformer locations (PAEC Q1 and Q2) at the facility are discussed below. The utility company removed these units when the facility ceased operation. Based on the March 6, 1995 letter from PSE&G, provided as Attachment 3 of Appendix B, these transformer units were not damaged by fire response activities. Sampling and further investigations for PAEC Q1 and Q2 are discussed below.

5.19.1 PAEC Q1: Western Transformer Pad

5.19.1.1 Area Description

Three transformers were located on a common concrete pad on the west side of the manufacturing building, north of the fire pumphouse. These units were put into service at the facility in 1983. Facility personnel believe that these transformers were not the original units used when the facility began operation in 1970. The area surrounding the approximately 15 feet by 20 feet concrete pad was gravel covered and unlined. Releases from these units could potentially have impacted the surrounding soil. As a result, in accordance with N.J.A.C. 7:26E-3.9(b)1, sampling was conducted as described below.

[22] The March 6, 1995 letter from PSE&G indicates that no transformer was present at Base Map Location No. 3. However, the last paragraph of the letter indicates that a transformer was located adjacent to the Base Map Location No. 3. Therefore, Base Map Location No. 3 has been adjusted to reflect PSE&G records.

5.19.1.2 Phase I Activities

ENSR collected one sample (TRANS 1) from the transformer fluid on May 24, 1995. This sample was analyzed for PCBs. As indicated in Table 5-49, no PCBs were detected.

5.19.1.3 Phase II Sampling Program

ENSR collected four samples (Q1-1 through Q1-4) from this area on April 23, 1996 from locations adjacent to the transformer pad. Figure 4-1 provides sample locations. Each sample was collected at a depth of 0.5 to 1 feet bgs, and was analyzed for PCBs and TPHC.

As indicated in Table 5-50, all PCB sample concentrations were below the NJDEP IGSCC. Nonetheless, because this area was easily accessible, ENSR excavated impacted surface soils as part of the general site remediation to remove residual materials. Remediation of the area was conducted on October 6, 1996. The limits of the excavation were defined by the surrounding pavement, block shed, and sample points Q1-1 and Q1-3. One post-excavation sample Q1-5 was collected at the base of the excavation at a depth of approximately 2 feet bgs on November 6, 1996. The sample was analyzed for PCBs. As indicated on Table 5-51, no PCBs were detected.

5.19.1.4 Conclusions and Recommendations

This area was delineated to NJDEP IGSCC. Moreover, the PCB contamination has been excavated. No further activities are proposed for this PAEC.

5.19.2 PAEC Q2: Eastern Transformer Pad

Another transformer was located outside of the manufacturing building, near the southeastern corner of the P&B area. This unit was located on an approximately 8 feet by 8 feet concrete pad, and the area surrounding the unit was concrete paved. Based upon discussions with Napp personnel, and an inspection of the pad, no evidence of releases from this area have been observed. As a result, no further investigation of this area is proposed.

During the May 15, 1996 NJDEP site inspection, there was confusion regarding the correct location of this transformer. The location has been verified and Figure 4-3 has been modified to indicate the correct location.

5.19.3 Dioxin Testing

In its October 1, 1996 letter, NJDEP indicated that dioxin sampling would be required if any of the on-site transformers were affected by the explosion/fire or if any other areas of concern with PCB contamination were affected by the explosion/fire. Based on information provided in a letter from PSE&G, provided in Appendix A, there is no record that the on-site transformers were damaged by the explosion/fire. Additionally, PCB contamination in other PAECs was generally below concrete floors or pavement. Wipe and chip samples did not indicate PCB contamination above floor level. There is no physical evidence to suggest that any PCB-contaminated areas could have been affected by the explosion/fire. As a result, dioxin sampling is not warranted.

5.20 PAEC R: P&B Area Compressor Unit

Two compressor units were used in the P&B area of the manufacturing building. These units generated compressed air for use in P&B operations. The system utilized non-contact cooling water contained within a closed-loop recirculation system. There was no direct discharge of cooling water from this system. Condensate from the exterior of the compressor entered a floor drain east of the compressor location and was discharged to the wastewater treatment system. There is no reason to believe that this condensate was contaminated, and therefore, there is no reason to believe that a potential contaminant discharge has occurred from the compressor. As a result, sampling or further investigations were not proposed or conducted.

The proposal for no further action was accepted by NJDEP in its October 1, 1996 letter.

5.21 PAEC S: Mounded Area

5.21.1 Area Description

Discolored soils were noted along the property fenceline on the bank of the Saddle River. A black powder/dust-like substance was observed in a slightly mounded area located outside the Napp fence line, to the west of the Tank Farm. The size of the pile is approximately 16 feet by 12 feet, with an approximate depth ranging from 1 to 3 feet. The composition and origin of this material is unknown. According to Napp personnel, the material may be soil excavated during installation of footings for the carbon dioxide tank (PAEC A5). In accordance with N.J.A.C. 7:26E-3.9(f), sampling was implemented as described below.

5.21.2 Phase II Sampling Program

ENSR collected one sample (S-1) from this area on April 24, 1996. Figure 4-1 provides the

sample location. In order to determine whether the material represented an environmental concern, one composite sample was collected and analyzed for the Full Scan and waste classification parameters.

As indicated in Table 5-52, the sample did not indicate any compounds above the NJDEP IGSCC.

5.21.3 Phase III Sampling Program

In order to further evaluate this area, one boring was advanced below the center of the soil mound. Samples were collected at depths of 1.7-2.2 feet bgs (the depth of what appeared to be native soil) and 2.2-4 feet bgs (due to poor auger recovery). Additionally, surface samples were collected at the north, south, east, and west boundaries of the stained area. Sample S-1A, collected at the base of the stained area, was analyzed for the Full Scan plus Cr^{+6}. All other samples were analyzed for chromium, Cr^{+6}, and copper. As indicated on Table 5-53, samples in this area indicated metals above NJDEP soil cleanup criteria.

In its October 1, 1996 letter, NJDEP requested further information regarding the 8-inch iron pipe located immediately below PAEC S. The source of discharge to the pipe is the former carbon dioxide tank containment. Any water entering this pipe would be solely stormwater. Based upon the usage of the pipe, there is no reason to suspect that discharges, if any, to the pipe have impacted the environment.

5.21.4 Conclusions and Recommendations

As discussed in Section 5.3, metals have been attributed to historic fill in the area of the Subject Site. Given the source of the mounded area material (excavated soil), the metals concentrations present are presumed to be related to the fill material. Napp and ENSR propose that this area be included within a DER, and capped to prevent direct contact.

5.22 PAEC T: Boiler Room

5.22.1 Area Description

The facility had one boiler room, located within Building No. 5. Boiler blowdown from facility boilers was piped directly into a drain located on the south side of the boiler room. This drain was part of the facility's wastewater collection system and discharged to the wastewater treatment system. The wastewater collection system for this area is illustrated on Drawing P-1 in the PA submitted to NJDEP February 1996.

Two compressor units were located in the boiler room. The system utilized non-contact cooling water which was contained within a closed-loop recirculation system. There were no direct discharges of cooling water from the system. Condensate accumulating from these compressor units was released to the concrete floor within the boiler room. Ultimately this material from these and two other compressor units in the general vicinity of the boiler room would enter the floor drain located on the south end of this area and discharge to the facility wastewater treatment system.

The floor of the boiler room was observed to be stained and cracked, indicating the potential that a discharge, if any, from the boiler system or compressor unit might have impacted the underlying soil. As a result, in accordance with N.J.A.C. 7:26E-3.9(d)5, sampling was conducted as described below.

5.22.2 Phase II Sampling Program

The drain was inspected and found to be of good integrity. The integrity of the drain will be confirmed during a proposed joint inspection to be conducted with the NJDEP. There is no reason to suspect that a discharge, if any, from this drain has impacted the environment. As a result, sampling or further investigations have not been conducted.

In order to assess the potential impact of boiler or compressor discharges, ENSR attempted to collect two soil samples from beneath the boiler room floor. However, upon drilling through the floor, a subsurface concrete vault was encountered. The vault, which was approximately 6 feet deep, was observed to contain approximately 4 feet of standing water. The water was observed to have a greenish tint, indicative of the non-hazardous fluorescein dye. The water in the vault is believed to be stormwater runoff, not groundwater. Due to the absence of soil below the floor, ENSR collected one sample and one duplicate sample from the standing water. The sample was collected on May 14, 1996, and was analyzed for the Full Scan. As indicated in Table 5-54, the sample did not indicate the presence of significant concentrations of any hazardous parameters.

5.22.3 Conclusions and Recommendations

There is no evidence of any impact on the environment resulting from this PAEC. Therefore, no further action is proposed for this area other than confirmation of the integrity of the drain on the south side of the room during the joint inspection with NJDEP.

5.23 PAEC U: Air Pollution Control

5.23.1 Area Description

The facility utilized a dust collector and baghouse system for manufacturing areas involving solid materials. The dust collector and baghouse were located outside the manufacturing building in the paved area adjacent to the drum storage area. Air contaminants from manufacturing areas were transferred to this pollution control equipment via a series of overhead ductwork. There is no reason to suspect that there were any releases from this system. However, cleanout of the system was conducted as part of the post-explosion facility decommissioning as described below.

5.23.2 Phase II Activities

This system was cleaned prior to dismantlement. The cleaning did not generate a recoverable amount of residue. No sample was collected.

5.23.3 Conclusions and Recommendations

There is no reason to suspect that this equipment has had any impact upon the environment. No further action is proposed for this area.

5.24 PAEC V: Pavement Cracking

5.24.1 Area Description

There are breaches in the site pavement in several areas of the facility. The potential exists for the underlying soil to have been impacted by explosion/fire response activities at the facility. During Phase II investigative activities, three representative areas were identified as follows:

- PAEC V1: Near PAEC L
- PAEC V2: North of PAEC N
- PAEC V3: East of PAEC N

In accordance with N.J.A.C. 7:26E-3.9(f) sampling was conducted, as described below.

5.24.2 Phase II Sampling Program

ENSR collected one sample from beneath each of the identified cracks (V1-1, V2-1, and V3-1) on April 24, 1996 as identified on Figure 4-1. Samples V1-1 and V2-1 were collected at a depth of approximately 0.5-1.0 feet bgs, and V3-1 was collected approximately 2.0-2.5 feet bgs, which was the first soil encountered below the pavement. All samples were analyzed for the Full Scan.

As indicated in Table 5-55, sample V3-1 indicated the presence of chlorobenzene at a concentration above the NJDEP IGSCC.

Through the course of the P&B trench investigation, discussed in Section 5.9, it was determined that sample V3-1 was actually collected within PAEC E,F,G. Further activity in this area was discussed in Section 5.9. Further delineation of V1 and V2 was conducted during Phase III as discussed below.

5.24.3 Phase III Sampling Program

At each location, one boring (V1-1 and V2-1) was advanced below the original sample location and samples were collected from depths of 3.5-4 feet bgs and 5.5-6 feet bgs. Additionally, surface samples were collected to the north, south, east, and west of samples V1-1 and V2-1. Sample locations are identified on Figure 4-1. Samples used to delineate PAEC V1 were analyzed for PCBs and copper. Samples to delineate PAEC V2 were analyzed for benzo(b)fluoranthene and benzo(a)pyrene.

As indicated on Table 5-56, the samples surrounding PAEC V1 did not indicate the presence of any constituents above the NJDEP IGSCC.

As indicated on Table 5-57, the samples surrounding PAEC V2 did not indicate the presence of any constituents above the NJDEP IGSCC.

Phase III sampling also included collection of one sample at 0-0.5 feet bgs at each of 7 additional locations of pavement cracking (V4-V10) (see Figure 4-1). Location (V8) was not sampled due to its proximity to the storm sewer samples. Each of these samples was analyzed for the modified Full Scan.

As indicated on Table 5-58, samples at each of the additional crack locations indicated the presence of constituents with concentrations above the NJDEP soil cleanup criteria. PCB

concentrations exceeded NJDEP IGSCC in sample V11. Sample V4 had a TPHC concentration above the total organic cap of 10,000 ppm.

5.24.4 Conclusions and Recommendations

Based upon the results of the Phase III investigation, elevated levels at PAEC V2, V7, and V14 are limited to PAHs and metals. The concentrations of these contaminants are erratic and do not exhibit any pattern. As discussed in Section 5.3, the soil in these areas has been identified as historic fill. The PAH concentrations present are indicative of, and are presumed to be related to, fill material. The concentrations of PAHs detected in the soil are well within the range of contaminants that the NJDEP has identified in historic fill. No further action is proposed in PAECs V1, V2, V7, and V14 for PAHs and metals at this time. ENSR and Napp anticipate that these areas will be included within a DER, and will be capped to prevent direct contact with the remaining constituents. No further action regarding these compounds is proposed.

PCBs were detected in sample V11 at a depth of 0.58-1.08 feet bgs at a concentration above NJDEP IGSCC. Soil boring V11 is located within a leased area only used for parking by Napp employees. Additional sampling is not proposed at this location since there is no record of PCB use during Napp's site operations. The PCBs are believed to be associated with historic operations.

5.25 PAEC W: Inconsistent Curbing

5.25.1 PAEC W1: Subject Site

5.25.1.1 Area Description

Curbing was installed around the parking area in the northwest corner of the property in 1992. This curbing was damaged during fire fighting operations on April 21, 1995 in one location approximately midway along the length of the curb along the western side of the parking area. The paved area has been designed to drain to one of two stormwater collection basins for ultimate discharge to the Saddle River. Releases of potentially contaminated materials in this area were prevented from being discharged to this water course by manually controlling a valve in the western catch basin. This valve was kept open only during normal operating hours and was closed on weekends. Although it is possible that contaminated fire water resulting from the facility explosion in April 1995 may have entered this area and discharged through this curbing to the surrounding banks of the Saddle River, no soil discoloration was observed in this area. In addition, the river water and sediment sampling previously discussed supports the determination that the fire did not impact the environment other than for the brief period during

and after the incident.

5.25.1.2 Phase III Sampling Program

In its October 1, 1996 letter, NJDEP requested that Napp collect one soil sample in this area. The sample (W-1) was collected in the location shown on Figure 4-1 at a depth of 0-0.5 feet bgs, and was analyzed for PP+40 on January 14, 1997. Table 5-59 summarizes the analytical results. Table 5-59 indicates that none of the concentrations of any of the compounds analyzed exceeded the NJDEP IGSCC in sample W-1.

5.25.1.3 Conclusions and Recommendations

The results of the sample W-1 indicate that additional sampling is not warranted. No concentrations of any of the compounds analyzed exceeded the NJDEP IGSCC. PAHs detected in the sample can be attributed to historic fill used in the area of the Subject Site. Therefore, no further action is proposed.

5.25.2 PAEC W2: Fortunato Property

5.25.2.1 Area Description

The northwest edge of the adjacent Fortunato property is not contained beyond the paved employee parking lot. Although the potential exists that contaminated fire water resulting from the facility explosion in April 1995 may have entered this area and discharged to the surrounding banks of the Saddle River, no soil discoloration was observed in this area. In addition, the river water and sediment sampling previously discussed supports the determination that the fire did not impact the environment other than for a very short period following the incident.

5.25.2.2 Phase III Sampling Program

In its October 1, 1996 letter, NJDEP requested that Napp collect one soil sample in this area. The sample (W-2) was collected in the location shown on Figure 4-1, at a depth of 0-0.5 feet bgs, and was analyzed for PP+40 on January 14, 1997. Table 5-59 summarizes the analytical results. Table 5-59 indicates that none of the concentrations of any of the compounds analyzed exceeded the NJDEP IGSCC.

5.25.2.3 Conclusions and Recommendations

The results of the soil sampling indicate that additional sampling is not warranted. No

concentration of any of the compounds analyzed exceeded the NJDEP IGSCC and PAHs detected in the sample can be attributed to historic fill used in the area of the Subject Site. Therefore, no further action is proposed.

5.26 PAEC X: Flammable Storage Cabinet

One flammable storage cabinet was maintained outside the manufacturing building to the north of the loading ramp within a paved area of the facility. This cabinet was typically used to store propane cylinders. Spills or leaks of material from this cabinet would have been in the gaseous state, and would not have impacted site soils or groundwater. Therefore, contamination of this area is not anticipated. As a result, sampling or further investigations were not proposed.

The proposal for no further action was accepted by NJDEP in its October 1, 1996 letter.

5.27 PAEC Y: Storm Sewer

5.27.1 Area Description

Storm water from the facility was directed to a storm sewer emanating from the northeast portion of the manufacturing building. The sewer ultimately discharged to the Saddle River through a single outfall (PAEC P). The total length of the storm sewer piping is approximately 230 feet, and includes four known manholes/inlets.

During facility operations only stormwater expected to be non-contaminated was discharged through this system. The system was kept closed during non-operating hours at the facility. There is no history of hazardous material or waste releases from the facility. However, due to the emergency response activities associated with the explosion/fire, it is possible that contaminated material may have entered the storm sewer system. In accordance with N.J.A.C. 7:26E-3.9(d)4, additional investigation to demonstrate the integrity of the system was conducted as described below.

5.27.2 Phase II Investigation

The storm sewer was cleaned out and inspected to the extent possible. On April 24 and May 14, 1996, samples of material removed from the storm sewer were collected and analyzed for the Full Scan and waste classification parameters. As shown on Tables 5-60 and 5-60A, samples STD-DR-1, STD-DR-2 and STD-DR-3(D) indicated the presence of phenol, base/neutrals, cadmium, and PCBs at concentrations above NJDEP soil cleanup criteria.

The storm sewer appears to be constructed similarly to typical storm sewers, specifically with jointed sections of pipe. The pipe joints can potentially affect the integrity of the line. Due to the potential lack of integrity in the storm sewer line, and the presence of contaminants of concern in the residue, sampling along the storm sewer line was conducted during Phase III.

5.27.3 Phase III Investigation

A total of eight samples (Y-1 to Y-8) were collected adjacent to the piping at 30 feet intervals, at the depth of the pipe invert. Sample locations are identified on Figure 4-1. As requested by NJDEP during the May 7, 1996 meeting, sample parameters were targeted based upon constituents detected in the residual material removed from the storm sewer. Each sample was analyzed for BN+15, phenol, cadmium, and PCBs.

As indicated on Table 5-61, none of the sample concentrations exceeded the NJDEP IGSCC. In its October 1, 1996 letter, NJDEP requested documentation of the integrity of the four manholes/inlets to this storm sewer. During Phase III sampling of the storm sewer line, samples were collected adjacent to each of these inlets and concentrations were below the NJDEP IGSCC. Therefore, no further documentation of their integrity is necessary.

5.27.4 Conclusions and Recommendations

As indicated on Table 5-61, samples Y-1 to Y-8 did not indicate the presence of any constituents above NJDEP IGSCC. Based on the results of the samples in these areas, further delineation is not warranted. It is anticipated that these areas will be included within a DER, and will be capped to prevent direct contact with the remaining constituents.

5.28 PAEC Z: Production Well

One inactive production well reportedly exists at the Subject Site. Napp reportedly never used this well and sealed it several years ago. As a result, no sampling was proposed for this PAEC.

The proposal for no further action was accepted by NJDEP in its October 1, 1996 letter.

5.29 PAEC AA: Water Main Pit

5.29.1 Area Description

During cleaning of the leased sheds in the rear of the Fortunato Property, a brick-lined pit was observed in the location shown on Figure 4-1. The purpose of the pit is believed to be as an access point to the water main. The pit is not believed to have been used by Napp during facility operations. The PAEC is approximately 10-feet in diameter with a depth of approximately 8 feet. Investigation of the pit is currently ongoing, however it appears that two trenches and four pipelines either enter or exit the pit.

5.29.2 Phase II Sampling Program

The residue in the pit was removed and disposed of off-site. The pit was cleaned and visually inspected. The integrity of the pit was evaluated and determined to be poor.

ENSR collected one sample (FP-1) from the pit residue on July 17, 1996. The sample, which consisted of solid residue at the bottom of the pit, was analyzed for the Modified Full Scan. As indicated in Tables 5-62 and 5-62A, the residue sample indicated PCB, TPHC, ethylbenzene, xylene and cis-1,2-dichloroethene at concentrations above the NJDEP IGSCC. Due to these elevated concentrations, and the poor integrity of the pit base, additional sampling was conducted during Phase III.

5.29.3 Phase III Sampling Program

In order to assess the impact of this pit on the environment, five borings were advanced in this area. Borings were advanced inside of the pit, and to the north, south, east, and west of the pit. Each sample was collected from below the depth of the pit base, 10-10.5 feet bgs, and analyzed for TPHC, PCBs, and VOC+10. Sample locations are shown on Figure 4-1.

As indicated on Table 5-63, samples WMP-C and WMP-D, located north and south of the pit, did not contain any constituents above NJDEP soil cleanup criteria. Samples WMP-A, WMP-B, WMP-E, located inside the pit and to the north and south of the pit, respectively, contained VOCs at concentrations above the NJDEP IGSCC. Additionally, the PCB concentration detected in WMP-A was above the NJDEP IGSCC. Sample WMP-A also contained a total volatile organics concentration above 1,000 ppm.

5.29.4 Conclusions and Recommendations

Further investigations are not proposed for this area. As discussed in Appendix A, Variance Request, ENSR and Napp propose to limit future off-site soil investigations to contamination associated with Napp's operations and to those compounds identified by Napp in the Hazardous Material or Hazardous Waste Inventory included in Attachment 3 of the February 1996 PA submitted on behalf of Napp. According to Napp personnel, PAEC AA was only used for storage of materials that did not contain the contaminants detected in the pit. In addition, as previously discussed this pit is not believed to have been used by Napp during facility operations. The detected contaminants are believed to be associated with the activities of other persons.

5.30 PAEC AB: Collection Pit

5.30.1 Area Description

During cleaning of the leased sheds in the rear of the Fortunato Property, a pit was observed in the location shown on Figure 4-1. The purpose of the brick-lined pit is unknown, and the pit is not believed to have been used by Napp during facility operations. The pit is approximately 6.5-feet in diameter with an approximate depth of 9 feet. A 24-inch pipe enters the northwest wall of the pit, leading to the PVSC pump station. Two trenches enter or exit the southwest and southeast walls of the pit, both of which contain residual material. A 12-inch clay pipe exits the northeast wall of the pit, and contains approximately 2 inches of residue. A 4-inch PVC line enters the pit from the northeast, near the top of the pit.

The integrity of the pit wall is fair, with degradation of the mortar in some areas. The pit appears to have a concrete base.

5.30.2 Phase III Sampling Program

In order to assess the potential impact of this pit on the environment, one residue sample was collected from the base of the pit (UPIT-1). The sample was analyzed for the Full Scan and waste classification parameters. As indicated on Tables 5-64 and 5-64A, no compounds were detected in the residue at concentrations above NJDEP IGSCC.

5.30.3 Conclusions and Recommendations

PCBs were the only compounds detected in the pit residue that are a concern in site soils. The PCB concentration detected in the residue sample was only 2.1 ppm, compared to the NJDEP IGSCC of 50 ppm. Therefore, this area is not expected to have contributed to the contamination of site soils above the NJDEP IGSCC. The pit has been cleaned out and the residual material has been properly disposed of off-site. No further action is proposed for this PAEC, other than inclusion in the site-wide cap and the DER.

5.31 PAEC AC: Leased Fortunato Property

5.31.1 Area Description

Napp leases an exterior area to the west of the Fortunato tenant buildings, south of the Napp drum storage area which consists of a parking area previously used to park employee vehicles. Napp also leases four storage areas located to the west of the approximate location of the leased warehouse and the finished goods warehouse. This area is identified on Figure 4-1 as "area used (leased) by Napp from Robert Fortunato". No activities related to manufacturing or storage of hazardous materials have ever been conducted in this area according to Napp personnel. The previous parking area is currently used by Napp for storage of frac tanks containing non-hazardous stormwater prior to discharge.

5.31.2 Phase II Sampling Program

Sampling was conducted in this area on August 6, 1996, by Fortunato's consultant, EMS. At that time, ENSR collected split samples with EMS. Following the protocol used by EMS, geoprobe samples were collected from a composite depth of 0-4.0 feet bgs, and were analyzed for PP+40. Only one of the four samples (FO-4) was collected in the area leased by Napp. The remaining three samples (FO-1, FO-2 and FO-3) were collected in the common area used by tenants of Robert Fortunato and are discussed in PAEC AD. Figure 4-1 provides sample locations.

As indicated in Table 5-65, none of the samples indicated concentrations of compounds which exceed NJDEP IGSCC. However, as discussed in Section 1.1, at the time of the Phase III sampling program, Napp and ENSR had not evaluated the data obtained to date and the unique factors affecting this case. The goal of delineating solely to NJDEP IGSCC had not been established as the basis for concluding this case. Accordingly, additional delineation sampling was conducted during Phase III as discussed below.

5.31.3 Phase III Sampling Program

During Phase III, ENSR advanced a boring adjacent to the boring previously advanced by EMS (FO-4) in the area leased by Napp. The boring was sampled at depths of 0-0.5 feet bgs and 0-0.5 feet above the saturated zone. The sample location is provided on Figure 4-1. Sample FO-4 (A/B) was analyzed for PAHs, PCBs, and VOC+10.

As indicated on Table 5-66, at depth samples FO-4A and FO-4B did not indicate the presence of any compounds at concentrations above the NJDEP IGSCC.

5.31.4 Conclusions and Recommendations

Based upon the data obtained to date, delineation of this area has been completed to NJDEP IGSCC. ENSR anticipates that this area will be included within a DER, and will be capped to prevent direct contact with the remaining constituents. Therefore, no further additional delineation of these compounds is proposed.

In its October 1, 1996 letter, NJDEP requested an inventory of any floor drains, trenches, catch basins, pits, stained areas, etc. in the shed areas located outside the back of the Fortunato buildings. Napp does not have any additional information in response to this request.

5.32 PAEC AD: Exterior Common Area Used by Tenants of Robert Fortunato

Tenants of Robert Fortunato used an exterior common area located to the west of the Fortunato tenant buildings and east of the area leased by Napp which was used to park employee vehicles. This area is identified on Figure 4-1 as "common area used by tenants of Robert Fortunato". No activities related to manufacturing or storage of hazardous materials have ever been conducted in this area by Napp.

5.32.1 Phase II Sampling Program

Sampling was conducted in this area on August 6, 1996, by Fortunato's consultant, EMS. At

that time, ENSR collected split samples with EMS. Following the protocol used by EMS, geoprobe samples were collected from a composite depth of 0-8.0 feet bgs, and were analyzed for PP+40. Only three of the four samples (FO-1, FO-2 and FO-3) were collected in the common area used by tenants of Robert Fortunato. Figure 4-1 provides sample locations for samples FO-1 to FO-3. The fourth sample (FO-4) is discussed in PAEC AC.

EMS reportedly continued sample collection to the south of the area used by Napp. In support of ENSR's conclusions related to regional contamination from the former UPDW facility, ENSR has requested information related to this additional sampling from Mr. Fortunato and NJDEP. As indicated in Table 5-65, the samples, FO-1 and FO-3, indicated VOCs at concentrations above NJDEP IGSCC. However, as discussed in Section 5.31.2, at the time of the Phase III sampling program, Napp and ENSR had not established the NJDEP IGSCC delineation objective. The delineation sampling conducted during Phase III is discussed below.

5.32.2 Phase III Sampling Program

During Phase III, ENSR advanced a boring adjacent to each of the borings previously advanced by EMS. Each boring was sampled at depths of 0-0.5 feet bgs and 0-0.5 feet above the saturated zone. Sample locations are provided on Figure 4-1. Each sample was analyzed for PAHs, PCBs and VOCs.

5.32.3 Conclusions and Recommendations

As indicated on Table 5-66, none of the results for the Phase III samples exceeded the NJDEP IGSCC. In addition, as discussed in Appendix A, Variance Request, no further investigations are proposed for off-site locations with contamination that is not believed to be associated with Napp's operations. Therefore, no further action is proposed for this PAEC.

5.32.4 Underground Storage Tank

Groundwater monitoring well MW-E4 was installed within the common area used by tenants of Robert Fortunato as directed by the NJDEP (as discussed in Section 5.33). Petroleum hydrocarbon LNAPL (light non-aqueous phase liquid) was detected in MW-E4 during development of the monitoring well. A sample of the LNAPL was submitted to Envirotech Research, Inc. (Envirotech) for PP+40 analysis on January 29, 1997. The results of this sample are shown in Table 5-67. Due to the LNAPL observed in MW-E4, the common area was investigated to locate a potential source area for the LNAPL.

On February 11, 1997 an underground storage tank (UST) located approximately fifteen feet from MW-E4 was discovered. The UST has a diameter of approximately ten feet and contains approximately nine feet of a thick oil-like substance. A sample of the material contained in the UST was collected on February 12, 1997 and submitted to Envirotech for PP+40 analysis. It was suspected that the LNAPL present in MW-E4 was related to the material found in the nearby UST. Therefore, two samples were collected on February 12, 1997, one from the LNAPL in MW-E4 and one from the UST. The samples were submitted to International Lubrication and Fuel Consultants, Inc. (ILFC) for identification, aging and comparison of the two samples. Results of the analysis performed for the samples by both laboratories is presented in Table 5-68.

Based on the results of the analytical data ENSR concludes that the two substances are waste oil.

5.32.5 Conclusions and Recommendations

A discussion between Robert Fortunato and ENSR personnel on February 25, 1997 revealed that Mr. Fortunato was aware of the above-referenced UST when Mr. Fortunato purchased the property in the early 1970's. Mr. Fortunato informed ENSR personnel that he will take responsibility for the closure of the UST. Prior to the discovery of the UST on February 11, 1997 Napp did not have any knowledge of the existence of the UST and did not use the UST at any time. Therefore, Napp will not take any further action in assessing the UST or the UST contents.

Since the UST and MW-E4 are located in a common area used by tenants of Mr. Fortunato, Napp did not use the UST and it has been determined that the contents of the UST and the LNAPL in MW-E4 are closely related based on analytical data, it is Napp's position that Mr. Fortunato also should be responsible for the LNAPL discovered in MW-E4, as well as the contents of the UST.

5.33 Site Groundwater

5.33.1 Phase I Sampling Program

Groundwater samples were collected by ENSR in May 1995 from four pre-existing monitoring wells located on the northeast portion of the property. These wells were installed by Hexcel in connection with the ISRA investigation at the adjacent former Hexcel site. The wells were installed to monitor the migration of contaminated groundwater from Hexcel to the Subject Site. Currently, groundwater in the water table aquifer beneath the Hexcel site is believed to flow predominantly west-southwest, towards the Saddle River. However, there is a zone of radial flow outward from a groundwater mound in the vicinity of Building 2. A review of Hexcel's NJDEP

file provided information regarding groundwater flow in the past at the Hexcel site. Groundwater has at times flowed in a south-southwest direction more parallel to the Saddle River than towards the river.

As summarized in Table 5-69, groundwater samples indicated the presence of volatile organic compounds, various metals, and polychlorinated biphenyls (PCBs) in concentrations above the NJDEP GWQS. Based on the inventory of materials used by Napp, many of the compounds that exceed these standards (e.g., cis-1,2-dichloroethylene, tetrachloroethylene, vinyl chloride, thallium, PCBs, chlorobenzene, chloroform, arsenic, and nickel) are not known to have been used in Napp's operations or were only used in small quantities. This indicates that contamination not related to Napp operations has migrated onto the Subject Site from off-site sources or is historical from former owners/operators of the property.

5.33.2 Phase III Sampling Program

5.33.2.1 Monitoring Well Installation

Between January 9 and January 15, 1997, ten monitoring wells (MW-E1 through MW-E10) were installed and developed on the Subject Site. All wells were installed in accordance with the NJDEP FSPM and TRSR. A New Jersey licensed driller employed by Advanced Drilling, Inc. of Washington, NJ performed all drilling activities under the technical supervision of an ENSR geologist. Soil samples were collected continuously using 2-inch diameter split spoons. Soil samples were screened for volatile organic vapors using an HNU photoionization detector (PID) and were characterized by the ENSR geologist. No soil samples were collected for laboratory analysis.

The wells were completed to depths of between 12.5 and 16 feet bgs where a grey silt/clay layer was generally encountered. Groundwater occurs between four and eight feet bgs, and the wells were screened from the bottom to depths of three and four feet bgs using four-inch diameter 20 slot Schedule 40 PVC. A sand pack (Morie #2) was installed in the annular space to approximately one foot above the top of the screen. The remaining annular space was filled with approximately one foot of fine sand (Morie #00) overlain by a mixture of bentonite and Portland cement grout to grade. The wells were finished with protective steel casing 3 feet above grade. Appendix I contains complete boring logs, well construction diagrams, and NJDEP Form A and B for each well.

The wells were developed on January 14 and 15, 1997. A small submersible pump was used to remove a sufficient volume of water from each well until the water became clear of silt and suspended material. Several wells (MW-E2, MW-E4, MW-E5, MW-E8, and MW-E9) were purged

dry during development. These wells were surged and purged repeatedly over an extended time period. All water was drummed, properly labeled and staged on-site to await proper disposal. Petroleum hydrocarbon LNAPL (light non-aqueous phase liquid) was detected in one of the wells (MW-E4) during development.

5.33.2.2 Groundwater Monitoring

The monitoring wells were gauged for depth-to-water before sampling activities began on January 28, 1997. On February 4, 1997, a New Jersey licensed surveyor, J. Peter Borbas P.L.S., surveyed the newly installed monitoring wells for location (latitude and longitude) as well as for elevation. At that time, a second round of groundwater elevations was obtained for the ten Napp monitoring wells (MW-E1 through MW-E10) and for the seven Hexcel wells (MW-22, MW-23, MW-24, MW-25, MW-29, MW-30, and MW-31) located on or adjacent to the Subject Site. Casing elevations are included on the site map Figure 4-1.

The groundwater elevation data collected from the 10 onsite (Napp) monitoring wells on January 28, and March 3, 1997 were plotted and contoured on Figure 5-11. The map dated January 28, 1997 represents the groundwater elevations at the time of groundwater sampling. The elevation measurement for MW-E5 was considered anomalous for this round based on subsequent measurements, and was not included in the construction of the isopleth map. Groundwater elevations across the Subject Site ranged from 20.57 feet (MW-E4) above mean sea level (msl) in the southwestern part of the property towards the Saddle River to 25.44 feet msl (MW-E2) at the center of the property near the northwestern edge of the historic trench area. The general groundwater flow direction appears to be to the west towards the Saddle River. An isolated area of high elevation (MW-E2) is located in the center of the property along the northwestern margin of the historic trench area near the pump house. Groundwater flow appears to be radial away from the center with an easterly component beneath the eastern portion of the Subject Site due to the presence of this local high. This apparent area of elevated groundwater may be due to infiltration of precipitation through the excavated historic trenches and/or a suspected leaking water main near the pump house (located at the western end of the historic trenches).

Due to the presence of water leaking upwards through the pavement near the pump house, ENSR personnel suspected that an on-site valve was faulty and possibly the cause of the isolated area of high elevation at MW-E2. It was estimated that water might be leaking from the water main at a rate of approximately 0.5 gallons per minute. The water main was subsequently shut off at the on-site valve. Groundwater measurements were collected within one week, but had not appeared to change. On February 26, 1997, the water main that served the Subject Site was shut off at the street.

Groundwater measurements were collected on March 3, 1997 six days after the water main was shut off at the street. The groundwater elevation measurements collected on January 28, and March 3, 1997 were contoured and are shown on Figure 5-11. The March 3, 1997 contour map shows that the area of high groundwater elevation observed in the vicinity of monitoring well MW-E2 still exists. However, the area of high elevation appears to be dissipating. Subsequent groundwater measurements collected since March 3, 1997 appear to confirm that the area of high groundwater elevation continues to be slowly dissipating.

5.33.2.3 LNAPL

As previously discussed, LNAPL was detected in monitoring well MW-E4. The LNAPL was measured at a thickness of 0.79 feet on January 28, 1997. The LNAPL was 1.63 feet thick on February 4, 1997. On February 12, 1997, LNAPL was detected in MW-E4 with a thickness of 2.27 feet. A fourth and fifth round of groundwater elevations were obtained on February 26, and March 3, 1997, respectively, with an LNAPL thickness of 3.25 feet measured on both days. As discussed in Sections 5.32.4 and 5.32.5, the LNAPL observed in well MW-E4 is not the responsibility of Napp due to its association with a waste oil UST on Robert Fortunato's property.

5.33.2.4 Groundwater Sampling

On January 28 and 29, 1997, groundwater was sampled from nine of the ten newly installed monitoring wells at the Subject Site. Monitoring well MW-E4 was excluded due to the presence of LNAPL. Groundwater sampling was completed according to the NJDEP FSPM. On January 28, prior to initiation of sampling, a synoptic water level round was completed for the ten Napp wells and seven on-site Hexcel wells. During the well gauging, an interface probe was used to detect the possible presence of petroleum hydrocarbon LNAPL and DNAPL (dense non-aqueous phase liquid) in the wells. DNAPL has not been detected in any Napp wells.

Prior to sampling, approximately three well volumes of water were purged from each well and placed in labeled drums staged on-site. After each volume was removed, field measurements were collected for pH, specific conductivity, dissolved oxygen and temperature. Field measurements are summarized in Table 5-70.

Groundwater samples were collected from each well using laboratory decontaminated teflon bailers. The samples were transferred to laboratory prepared sample jars, preserved on ice and transported to Envirotech Research, Inc. of Edison, NJ. The groundwater samples were analyzed for priority pollutant metals, PCBs, VOCs, and acid extractables. One sample of the LNAPL in MW-E4 was collected using a dedicated disposable bailer. The sample was transferred to a laboratory prepared bottle, properly labeled, stored on ice and transported to the laboratory.

In accordance with the NJDEP FSPM, proper quality assurance procedures were followed during sampling including the collection of duplicate samples, field blanks and trip blanks.

5.33.2.5 Groundwater Analytical Results

A summary of analytical results for groundwater sampling is presented in Table 5-71. Compounds in brackets are in exceedance of the designated NJDEP GWQS. The complete Envirotech analytical report for groundwater samples is presented in Appendix F (provided under separate cover). A total of nineteen volatile organic compounds (VOCs) and three semivolatile organic compounds (SVOCs) were detected in the groundwater samples analyzed. PCBs and a total of thirteen metals were also detected in the samples.

The only PCB compound detected in the groundwater was Aroclor 1242. Aroclor 1242 was detected in wells MW-E5, MW-E7 and MW-E9 at concentrations of 1.4 ppb, 4.1 ppb (4.8 ppb in the duplicate sample (MW-E7A) for MW-E7) and 130 ppb, respectively. The detection of Aroclor 1242 is significant because this Aroclor is found in the soil and groundwater on the adjacent Hexcel site. However, Aroclors 1254 and 1260 are the predominant Aroclors detected in the soil at the Subject Site. The detection of Aroclor 1242 is an indication that groundwater contamination has migrated onto the Subject Site from the north.

Figure 5-12 lists the contaminants found in each well that exceed NJDEP GWQS and the concentration that was detected. Figure 5-13 depicts the isopleth maps which show the concentration and aereal extent of trichloroethylene, cis-1,2-dichloroethylene, tetrachloroethylene, phenol and chlorobenzene. Surfer Version 6 for Windows was used to create the preliminary isopleth maps. ENSR hydrogeologists then reviewed and fine-tuned the isopleths to appear as they do on Figure 5-13.

Groundwater sampling results indicate hot spots of trichloroethylene (17,000 ppb), tetrachloroethylene (7,500 ppb), and chlorobenzene (11,000 ppb) around monitoring well MW-E10 located along the northern margin of the trenches. The phenol isoconcentration map shows a hot spot centered around MW-E8 located in the northeastern portion of the Subject Site. The cis-1,2-dichloroethylene isoconcentration map indicates a hot spot at monitoring well MW-E7, located in the northeastern corner of the property.

The isoconcentration maps for cis-1,2-dichloroethylene, chlorobenzene, phenol, and tetrachloroethylene all show a secondary hot spot around monitoring well MW-E9. During well development and purging prior to sampling, it was noted that the discharge from this well remained turbid (cloudy and silty). The presence of elevated concentrations for several compounds in the groundwater samples for MW-E9 may be due to the presence of suspended solids in the sample

rather than actual levels of dissolved compounds present in the groundwater.

5.33.3 Conclusions and Recommendations

Review of groundwater investigation/remediation site activities at the adjacent Hexcel site indicates that the next phase of groundwater investigation at the Subject Site should include investigations of the depth to the top of the silt/clay layer, the continuity of the silt/clay layer and thickness of the silt/clay layer on-site. This layer at the Hexcel site has acted as an impermeable layer separating the water table aquifer from a lower confined unconsolidated aquifer. In one area beneath the Hexcel property, a depression in the surface of the clay layer has acted as a trap for the accumulation of DNAPL. Approximately 2,000-gallons of DNAPL have been recovered at the Hexcel site.

ENSR proposes to conduct a geoprobe investigation to evaluate the depth to the top of the silt/clay layer and continuity of the silt/clay layer beneath the Subject Site. The geoprobe investigation also will investigate whether there is DNAPL trapped on the top of the silt/clay layer. There are two main objectives for the geoprobe investigation: 1) to evaluate the depth to the top of the silt/clay layer and 2) to evaluate the continuity of the silt/clay layer both horizontally and vertically. The thickness of the silt/clay layer will be investigated during the installation of the deep monitoring wells, as described below.

To accomplish the first objective of the geoprobe investigation, geoprobe borings will be completed to the top of the silt/clay layer. The results of this investigation will be used to create a map depicting the topography of the silt/clay layer. Mapping the topography of the silt/clay layer is needed to identify the location of depressions that may control the distribution of separate-phase DNAPL at the Subject Site.

The second objective of the geoprobe investigation is to evaluate the continuity of the silt/clay layer. Both the composition of the layer and the presence of the layer (horizontal extent) will be investigated. The continuity of the composition of the silt/clay layer will be evaluated by penetrating the top 0.5 to 1.0 feet of the silt/clay layer with the geoprobe borings. The lithology will be evaluated by the onsite ENSR geologist. This evaluation will provide information on the effectiveness of the silt/clay layer as a confining layer. Borings will be completed at a number of locations as shown on Figure 5-14.

At the eastern property boundary of the Hexcel site, the silt/clay layer becomes thin and is not present at the locations of MW-1 and MW-17 on the Hexcel site. Geoprobe borings will be completed along the eastern property line of the Subject Site to check if the silt/clay layer is present (horizontal delineation). Absence of the silt/clay layer could provide a migration pathway

or window for DNAPL to travel to the deeper, confined, unconsolidated aquifer. Figure 5-14 depicts the proposed approximate locations of the geoprobe points. Geoprobe locations may be changed in the field based on field conditions, the results of the proposed soil delineation samples (to be completed prior to the geoprobe investigation), and the results of previous geoprobe results once the investigation is commenced.

Additional water table monitoring wells are proposed for the Subject Site to further characterize the subsurface geology and groundwater conditions, and to investigate the limits of VOC, PCBs and metals contamination in the groundwater beneath the Subject Site. Four additional water table (completed above the silt/clay layer) monitoring wells (MW-E11 through MW-E14) are proposed. Figure 5-14 depicts the locations of the monitoring wells. The locations were chosen to evaluate and to further define the distribution of the concentration of VOCs, SVOCs, PCBs, and metals migrating onto the Subject Site either due to the regional contamination or other off-site sources.

Five additional monitoring wells (MW-E15D through MW-E19D) will be installed below the silt/clay layer in the confined unconsolidated aquifer. These monitoring wells will be installed as double-cased wells. Section 6.4.2 describes the proposed monitoring well installation procedures for the double cased wells. Figure 5-14 depicts the locations of these monitoring wells. The locations were chosen to examine the groundwater flow direction, hydraulic gradient, and the groundwater quality in the deeper overburden stratum as the groundwater enters and exits the Subject Site. Hexcel depicts the flow direction for the confined unconsolidated aquifer as south-southwest, which makes the Subject Site downgradient of the Hexcel site.

Due to the limited hydrogeologic data available at this time, the following items are being proposed:

- Regular gauging of monitoring wells for both groundwater elevations and possible DNAPL accumulations. This will provide information regarding the seasonal groundwater flow regime for the Subject Site.

- Groundwater sampling of the monitoring wells, after installation of the proposed monitoring wells, to characterize the extent of contamination present in the groundwater below the Subject Site, as well as to confirm the presence of off-site sources. Table 6-1 summarizes the proposed sampling parameters for the monitoring wells. Monitoring wells located within the site will be sampled for specific compounds that were detected in the soil at concentrations above the NJDEP IGSCC or in the groundwater above NJDEP Class IIA GWSQ. Existing and proposed monitoring wells located along the Subject Site boundary will be sampled for VOC+10, BN+15, AE+10, phenol, TPHC,

PCBs and priority pollutant metals.

5.34 Asbestos

In its October 1, 1996 letter, NJDEP requested a determination of whether there has been any discharge of asbestos to the environment as a result of the explosion/fire. As indicated in the PA Report, asbestos is present on the roof of Buildings 3 and 5. These buildings were not affected by the fire/explosion. During demolition of these buildings, Napp will employ the services of a licensed asbestos contractor to prevent a discharge of asbestos to the environment. There is no other known asbestos present at the facility.

6.0 REMEDIAL INVESTIGATION WORKPLAN ADDENDUM

Based upon a review of the data obtained to date, several areas of the Subject Site require additional delineation prior to remediation and/or acceptance of environmental restrictions.

6.1 Schedule

The schedule for this project will be dependent on NJDEP review and comments on the RIR/RIWP addendum. As previously discussed with NJDEP, Napp would like to complete closure of the Subject Site as soon as possible. Representatives of Napp would like to meet with NJDEP subsequent to submittal of this report. To allow for NJDEP review, a meeting in August 1997 is proposed. NJDEP will be contacted in late July to discuss a meeting. Following our meeting with NJDEP and agreement on the proposals contained herein, Napp will submit a detailed schedule to NJDEP.

6.2 Project Personnel

The responsible project personnel remain unchanged since the submittal of the RIWP in February 1996.

6.3 Remedial Investigative Strategy

An appropriate remedial investigation strategy has been developed for each PAEC and the entire Subject Site based on the remedial investigation conducted to date. This strategy was developed to delineate horizontally and vertically the extent of soil contamination at the PAECs that have not been fully delineated by the remedial investigation to date, and to further investigate the groundwater quality and flow directions beneath the Subject Site. The soil analytical parameters have been reduced at each PAEC based on the remedial investigation conducted to date. A summary of proposed activities for each PAEC identified in Section 5.0 is presented in Table 6-1.

6.4 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) as presented in the February 1996 RIWP will remain in effect for the continued remedial investigation.

6.4.1 Sampling Methodology

All sampling procedures will be conducted in accordance with the May 1992 NJDEP FSPM.

Soil borings will be installed at the proposed locations shown on Figure 5-10. Specific sampling depths and analytical parameters for each of the PAECs are discussed in Section 5.0 and summarized on Table 6-1. Soil samples will be collected using either truck-mounted drill rigs, truck-mounted direct-push technology (i.e. Geoprobe), hand-operated bucket augers, or hand trowels. To the extent reasonably possible, borings will not penetrate the silt/clay layer. Samples collected using a drill rig will be obtained using a decontaminated stainless steel, split spoon sampler which will be driven into the ground in 2-foot increments. Samples obtained using a Geoprobe will be collected using a decontaminated stainless steel discrete sampling tool which will be pushed into the ground in either 2-foot or 4-foot increments. Shallower samples will be collected using stainless steel decontaminated hand augers. Surface samples will be collected using stainless steel hand trowels. Stainless steel bowls and trowels will be used to collect, homogenize, and transfer soil samples to laboratory-provided sample containers. The aliquot for volatile organic compound analysis, where required, will be collected directly into the appropriate sample containers.

All aqueous and non-aqueous sample collection apparatus will be fully decontaminated before sampling and between sampling events in accordance with procedures outlined in the NJDEP FSPM and the RIWP addendum.

6.4.2 Monitoring Well Installation Procedure

Water table aquifer monitoring wells will be installed to the top of the silt/clay layer. To the extent reasonably possible, water table monitoring wells will not penetrate the silt/clay layer. The boring for the well will be advanced using the hollow stem auger drilling method to the silt/clay layer. Continuous split-spoon soil samples will be collected from the ground surface for lithologic characterization. In accordance with NJDEP specifications, wells will be completed with a 4-inch diameter PVC casing and a maximum 15-foot section of 0.01-inch slotted PVC screen. The actual depth and length of each screen will be determined by the ENSR field hydrogeologist. A sand pack (Morie #1) will be placed around the slotted well screen extending to 1 foot above the top of the screen. Approximately one foot of fine (Morie #0) to very fine (Morie #00) sand will overlie the sand pack. A grout mixture of high grade bentonite and Portland cement will be grouted into the annular space above the bentonite plug to provide a proper seal. All monitoring wells installed at the Subject Site will be finished with stickup protective casings.

Confined unconsolidated aquifer monitoring wells will be installed five feet into the aquifer below the silt/clay layer. ENSR proposes to install double-cased wells (in accordance with ASTM standard D 5092-90, Section 8.8.3) to minimize the potential for cross contamination of the lower aquifer. The boring for each well will be advanced using the hollow stem auger drilling method to the silt/clay layer. Continuous split-spoon soil samples will be collected from the ground surface for lithologic characterization. In accordance with NJDEP specifications, a six-inch steel outer casing will be set 5 feet into the silt/clay layer (approximately 20 feet bgs) followed by the emplacement of a cement/grout seat that will be allowed to cure overnight. Borings will be continued using the mud rotary drilling method to an anticipated maximum depth of 35 feet. Double-cased wells will be completed with a 2-inch diameter PVC inner casing and a maximum 5-foot section of 0.01-inch slotted PVC screen. The actual depth and length of each screen will be determined by the ENSR field hydrogeologist. A sand pack (Morie #1) will be placed around the slotted well screen extending to 1 foot above the top of the screen. Approximately one foot of fine (Morie #0) to very fine (Morie #00) sand will overlie the sand pack. A grout mixture of high grade bentonite and Portland cement will be tremie-grouted into the annular space above the bentonite plug to ensure the proper seal.

6.4.3 Sample Quality Assurance

Field blanks, duplicates, and trip blanks will be collected in accordance with the NJDEP FSPM and the February 1996 RIWP.

ENSR proposes to continue collecting soil VOC samples using the methodology described in the May 1992 NJDEP FSPM notwithstanding that the readopted TRSR (May 1997) includes a new field preservation method for soil VOC sampling utilizing methanol as a preservative. For data consistency purposes, ENSR requests that the new soil VOC sampling methodology not be required at the Subject Site, and that the preservation method previously used for this investigation be continued. In light of the presumptive remedy of capping and entry into a DER for this area of Main Street, continued use of the non-methanol preservation method will provide a data set that can be directly compared with existing data, and will adequately capture constituent concentrations relevant to human health issues and the environment. Moreover, the future use of the new methodology will result in analytical results that are not comparable to the extensive data already obtained.

6.5 Health and Safety Plan

All activities covered by the HASP will be conducted in complete compliance with this HASP and with applicable federal, state, and local health and safety regulations, including 29 CFR 1910.120.

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